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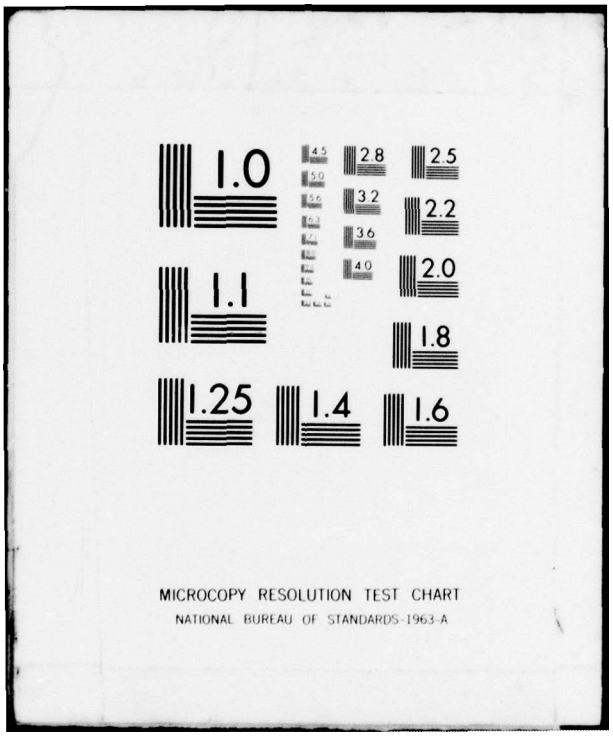
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Research Report 1216

LEVEL II

STUDIES IN LONG RANGE TARGET IDENTIFICATION

William L. Warnick and Albert L. Kubala
Human Resources Research Organization

ARI FIELD UNIT AT FORT HOOD, TEXAS

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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This report describes the development of two training programs in long range target recognition/identification. One program is a self-administered program in a slide/tape format. The other is designed for use in a classroom and employs 35mm slides. A complete instructor's guide is provided for the classroom program. A pilot study in nighttime target identification is also described.

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Research Report 1216

STUDIES IN LONG RANGE TARGET IDENTIFICATION

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FOREWORD

The Fort Hood Field Unit of the Army Research Institute for the Behavioral and Social Sciences (ARI) provides support to Headquarters, TCATA (TRADOC Combined Arms Test Activity). This support is provided by assessing human performance aspects in field evaluations of man/weapons systems.

A war using modern weapons systems is likely to be both intense and short. US man/weapons systems must be effective enough, immediately, to offset greater numbers of an enemy. Cost-effective procurement of improved or new combat systems requires testing that includes evaluation of the systems in operational settings similar to those in which the systems are intended to be used, with troops representative of those who would be using the systems in combat. The doctrine, tactics, and training packages associated with the systems being evaluated must themselves also be tested and refined as necessary.

This report describes a training program in long range vehicle recognition which is based on the results of research conducted previously. Both friendly and potential threat vehicles are included. It also describes a brief attempt to determine the potential usefulness of the XM-65 gunsight in combination with the AN/PVS-5 Night Vision Goggles in nighttime target identification.

ARI research in this area is conducted as an in-house effort, and as joint efforts with organizations possessing unique capabilities for human factors research. The research described in this report was done by personnel of the Human Resources Research Organization (HumRRO), under contract MDA907-78-C-2017, monitored by personnel from the ARI Fort Hood Field Unit. This research is responsive to the special requirements of TCATA and the objectives of RDTE Project 2Q763743A775, "Human Performance in Field Assessment," FY 1978 Work Program.

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Technical Director

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STUDIES IN LONG RANGE TARGET IDENTIFICATION

BRIEF

Requirement:

The work described in this report is that originally referred to in the Statement of Work dated 14 March 1978, under the title, "Long Range Target Recognition." The acquisition of the TOW system on the attack helicopter has given Army aviators the capability of engaging targets at standoff ranges (over 3000 meters). Previous research has shown that aviators can learn to identify ground vehicles at ranges up to 4000 meters under ideal conditions with the aid of the 13X TOW Sight (TSU). However, most recognition training is geared to much closer ranges. This training is simply not adequate in teaching aviators to recognize vehicles at the longer ranges where recognition cues are very minimal.

A need for a training program geared to long range ground vehicle recognition was expressed by authorities of the 6th US Cavalry Brigade (Air Combat).

The acquisition of the AN/PVS-5 (CAV NAV) Night Vision Goggles has provided Army aviators with a 24-hour capability. However, authorities were concerned that aviators would not be able to recognize vehicles at night, even with the goggles. The 6th Cavalry Brigade (Air Combat) requested an investigation of the usefulness of the combination of the TSU and the CAV NAV Goggles in vehicle recognition.

Procedure:

Research in long range vehicle recognition conducted previously employed HO scale models of both friendly and threat vehicles on a scale model terrain board. The aviators who participated felt that their participation provided them with excellent training. However, the technique required the use of a helicopter with a TSU, and therefore, was not easily adaptable to classroom training. This effort was mounted in an attempt to duplicate the principal features of the earlier program in a format suitable for classroom training. Photographs (35mm slides) of the models on the terrain board were made. By proper scaling of the projected image and the distance between the image and the trainee, the visual angle occupied by the vehicle can be made to represent the visual angle occupied by a full-scale vehicle at any desired range.

A second vehicle recognition program was developed in conjunction with a target handoff study. This program was a self-instructional program in a slide/tape format. This program was revised and divided into two sections, each requiring approximately 40 minutes to complete.

A pilot study was conducted to determine the ranges at which vehicles could be recognized at night employing the TSU/CAV NAV Goggle combination. The study was conducted under approximately 40% of full-moon illumination. A full-scale study was cancelled as none of the participants was able to identify any vehicle at the minimum range of 500 meters.

Principal Findings:

- The use of the TSU/CAV NAV Goggles for long range vehicle recognition at night does not appear to be feasible in most conditions without some artificial illumination.

Utilization of Findings:

Attack helicopter crewmen can identify armored vehicles at standoff ranges employing the TSU. However, they need to be trained to make distinctions with the minimal cues available at these ranges. The training programs developed in this effort should provide aviation units with this training capability.

The finding that the TSU/CAV NAV Goggle combination is, at best, of very limited use in night vehicle recognition should impact on tactical planning. However, further research in this area is needed to determine the level of illumination actually required.

CONTENTS

CHAPTER		PAGE
1	Introduction	1
2	A Classroom Training Program in Vehicle Recognition/ Identification	4
	Introduction	4
	Training Program Design	4
3	A Self-Instructional Program in Vehicle Recognition/ Identification	8
	Introduction	8
	Training Program Design	8
4	Vehicle Recognition at Night	11
	Introduction	11
	Procedure	11
REFERENCES		13
APPENDIX:	Instructor's Guide	15

TABLE

2-1	Target Array	6

STUDIES IN LONG RANGE TARGET IDENTIFICATION

Chapter 1

INTRODUCTION

The acquisition of the TOW weapons system on the Attack Helicopter (AH) has given Army aviators the capability of engaging armored vehicle targets at ranges well in excess of 3000 meters. Originally, authorities were concerned that aviators might not be able to positively identify vehicles at these ranges. Therefore, a research effort was mounted to determine the ranges at which armored vehicles could be identified by TOW gunners. A series of experiments was planned. In each succeeding experiment, the task of the observer was made more difficult. Essentially, the studies completed progressed as follows:

(a) Uncamouflaged vehicles were viewed against a plain but textured green background.
(b) Camouflaged vehicles were viewed against a plain but textured green background.
(c) Camouflaged vehicles were viewed against a terrain background.

The earlier efforts in this research program have been described by Haverland and Maxey.[1] The later efforts have been reported by Warnick, *et al.*[2] All of these studies were conducted employing HO scale (1/87) models viewed at properly scaled ranges. In the first study, observers were equipped with 7x50 binoculars. In all succeeding studies, the observers viewed the vehicles through a TOW Sight Unit (TSU) powered by an auxiliary power unit. In every case, observers were first administered a pretest. This was followed by a training session, and finally by a posttest.

Most of the aviators who served as observers in this research had had considerable training in vehicle recognition and identification.[3]

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[1] E. M. Haverland and J. L. Maxey. *Problems in helicopter gunnery*, HumRRO Final Report FR-WD-TX-77-5, May 1977. (ARI Technical Report, in process.)

[2] W. L. Warnick, G. D. Chastain, and W. H. Ton. *Long range target recognition and identification of camouflaged armored vehicles*, HumRRO Final Report FR-WD-TX-78-7, May 1978. (ARI Technical Report, in process.)

[3] In previous work "recognition" implied the proper labeling of a vehicle as a friendly or a threat vehicle. "Identification" implied the actual naming of the vehicle (e.g., M60, Chieftain, T-62, etc.). The same usage is employed in this chapter.

However, in the pretest situation, they were only able to correctly identify the vehicles in approximately 60% of the presentations. During training distinguishing characteristics of the vehicles perceptible at long ranges were pointed out, and feedback was provided. As a result, posttest performance approached 100% accuracy in both recognition and identification. This was true even in the most difficult condition (camouflaged vehicles viewed against a terrain background) and when the vehicles were viewed at a scaled range of 3500 meters.

Obviously, this research showed that armored vehicles can be recognized and identified at tactical ranges, at least under the conditions prevailing during the research. However, the comparatively poor pretest performance indicated that prior training had not fully prepared the aviators for the task. Several reasons became apparent early during the course of the research. For example, it became obvious that many aviators were looking for cues that simply were not visible at long ranges. Many aviators also looked for cues which might not always be present. For example, several aviators stated that they failed to correctly identify the M60 tank as it had no searchlight. While most M60 tanks do carry a searchlight, it is removable, and could easily be destroyed during battle. However, during the course of training, the observers learned to identify the vehicles on the basis of the very minimal cues which are available at long ranges.

Discussions with the aviator participants and examination of the materials available for training showed that most of the previous training was accomplished with imagery that provided too much detail. That is, photographs taken at very close, rather than at tactical, ranges were employed. Detailed line drawings and models viewed at close range were also used. As a result, the aviators had learned to distinguish between vehicles on the basis of cues which were easily discernible at close ranges, but were not visible at tactical ranges. Also, the emphasis in training appeared to be on threat vehicles, with the result that less was learned about the characteristics of friendly vehicles. This, too, is believed to be in part responsible for the fact that the US M60 tank was no more easily identified than the other vehicles in the studies.

The aviators who participated in the studies felt that the training they received while participating was very worthwhile, and that the procedures employed should be used regularly in vehicle recognition/identification training. However, the technique required the use of a helicopter with a TOW Sight Unit, and therefore, was not easily adaptable to classroom training. Nevertheless, it was felt that the principal features of the training involved in the research program could be employed in a format suitable for classroom training. The following chapter of this report describes the development of a training program based on the procedures used in the research described.

Concurrently with the work on long range target recognition and identification, Ton and co-workers[4,5,6] were conducting research to develop efficient techniques for handing off targets. A simulation employing static imagery was developed. In the simulation, one aviator played the role of an Observation Helicopter (OH) crewman and one played the role of an AH crewman. Each viewed the same scene, but from a different perspective and range. The aviator playing the OH crewman was shown the designated target, and his job was to hand the target off to the AH crewman through oral communication. The target in some situations was only partially visible to the AH crewman. Once the AH crewman believed he had acquired the target, he was required to make a positive identification.

During the conduct of the handoff research, it was discovered that the majority of aviators were unable to positively identify many of the potential targets, often mistaking a friendly vehicle for a threat vehicle and vice versa. Therefore, for the final phase of the research, a self-instructional program in target identification was developed. A slide/tape format was employed, and the program proved to be highly successful. Consequently, the program was expanded to include additional vehicles. Details on the development of this program are provided in Chapter 3.

The acquisition of the AN/PVS-5 (CAV NAV) Night Vision Goggles has given Army aviators a 24-hour flight capability. Furthermore, it is anticipated that any armored conflict with a sophisticated enemy may well be conducted on a 24-hour a day basis. Consequently, authorities in the sponsoring unit were concerned about both the day and night recognition/identification capabilities of their aircrewmen and requested that recognition/identification research similar to that described be conducted under nighttime lighting conditions. Although this work did not lead to the development of any additional training programs, it has not been reported elsewhere, and will be described briefly in Chapter 4.

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[4]W. H. Ton, W. L. Warnick, A. L. Kubala, and J. L. Maxey. *Study of air-to-ground and ground-to-air target handoff*, ARI Research Problem Review 76-10, Human Resources Research Organization, Alexandria, Virginia, October 1976.

[5]W. H. Ton and A. L. Kubala. *Study of target handoff techniques*, HumRRO Final Report FR-WD-TX-77-8, May 1978. (ARI Technical Report, in process.)

[6]W. H. Ton, P. W. Hemingway, and G. D. Chastain. *Further study of target handoff techniques*, HumRRO Final Report FR-WD-TX-78-5, May 1978. (ARI Technical Report, in process.)

Chapter 2

A CLASSROOM TRAINING PROGRAM IN VEHICLE RECOGNITION/IDENTIFICATION

Introduction

The "Long Range Target Recognition and Identification Training Program" was developed to provide training in armored vehicle recognition and identification at extended ranges (2000-4000 meters) for air cavalry personnel whose duties include aerial observation. The program is intended to be more than merely a "threat" program. Its scope was broadened to include US armored vehicles and armored vehicles of countries considered to be allied with the United States, as well as threat vehicles.

The program was designed as a basic program in recognition and identification. The objectives were developed in a joint meeting between staff personnel from the Sixth US Cavalry Brigade (Air Combat) [6th ACCB] S-2 Office, Threat Center personnel, and the ARI/HumRRO research team. The objectives were as follows:

- To develop a modular type training program; each module to be a complete training block which could be administered within a short time period.
- To provide a training program which would involve a minimum of supportive materials and impose no undue demands on instructor participation.
- To employ the same principles which had been used by the ARI/HumRRO team in the two previous experimental studies in "Long Range Target Recognition and Identification."
- To conduct the training in a more realistic fashion by teaching aerial observers to recognize and identify armored vehicles using the same image sizes that would be seen under actual field conditions.

Training Program Design

In all but the last of the experimental studies, five vehicles were used. In the pretest, each vehicle was presented in each of five different views [Side Left (SL), Side Right (SR), Oblique Left (OL), Oblique Right (OR), and Front (F)]. Presentations were in blocks of five, that is, each vehicle was presented once in each of the five

blocks. Presentation order and view were randomized between the blocks with the single restriction that each view of each vehicle had to be presented once. However, there were no pauses between blocks, so that the observers saw the presentations as being continuous. Furthermore, the same vehicle could appear twice in succession (e.g., last in one block and first in the following block).

The presentations during the training phase were handled in the same manner, but two sets of five blocks were employed for a total of 50 possible presentations. However, training was terminated whenever an observer reached criterion, i.e., correctly identified all vehicles in three successive blocks. Following training, each observer received a posttest which contained a single view of each of the five vehicles. Again, presentation order and view were randomized across observers.

The same general format was employed in the design of the training program. However, a pretest, as such, was eliminated, as the program was intended for training rather than for testing of previous capabilities. However, a pretest could easily be given if one is desired. This could be accomplished by having the instructor provide no feedback during the presentation of the first series of slides, and collecting the trainees' answer sheets prior to any actual instruction.

Vehicle selection. Personnel from the S-2 Office and the Threat Center, 6th ACCB, were asked to select a list of vehicles for inclusion in the training program. Of the 45 vehicles selected, 20 were commerically available as HO scale models. Three vehicles which were not available through commercial channels (Soviet T-72, T-62, and ZSU 23/4) were considered to be highly critical, and were handcrafted. Hence, a total of 23 vehicles were employed in constructing an initial set of training modules.

Visual imagery. Each of the 23 vehicles was photographed in each of the five views on the terrain board employed in the last experiment. Camera-to-vehicle distance was kept constant throughout so that the projected images would be in the proper relative sizes. Camera angle, vehicle location on the terrain board, and lighting were also kept constant. Finally, each vehicle was photographed as if the observer were looking downward from an angle of approximately 10°. Sets of colored 35mm slides were produced from each photograph.

Module construction. Six modules were constructed employing the 23 vehicles. The vehicles which make up each of the first five modules were selected by type of vehicle or size of vehicle. (See Table 2-1.) For example, each module contains at least one of the larger tanks (T-72, T-62, Chieftain, Centurion, Leopard, AMX-30, and M60A1). Each module was also given one of the smaller vehicles (Scorpion, AMX-13, BTR-50, Scimitar, and Jagdpanzer). Each module also contains one of the more square or box-shaped vehicles (M113, M109 SP, ZSU 23-4, Marder, and ZSU 57-2). The smaller tanks or tank-like vehicles (M551, PT-76, and

T-54/55) and the remaining larger tanks were distributed so that each module contains at least two such vehicles. The remaining vehicles (BTR-60P, Gepard, BTR-50, and Roland were distributed so as to fill each module with five vehicles. However, since only 23 vehicles were available, two vehicles had to be used twice. The vehicles selected were the Chieftain and the T-54/55. No attempt was made to control the mix of vehicles in each module based on friendly or threat status.

Module 6 was designed to present a difficult "test case" of recognition/identification ability. All of the tanks are main battle tanks and, therefore, have many common characteristics.

Table 2-1. Target Array

Training Module 1	Training Module 4
T-62	AMX-30
BTR-60P	PT-76
Leopard	Scimitar
M113 APC	Marder
Scorpion	T-72
Training Module 2	**Training Module 5**
Centurion	Chieftain
M60A1	ZSU 57/2
Gepard (Flakpanzer)	Jagdpanzer (JPZ 4-5)
AMX-13	T54/55
M109 SP	Roland (Marder)
Training Module 3	**Training Module 6**
Chieftain	T-62
M551	M60A1
T54/55	T-72
ZSU 23/4	Leopard
BTR-50	AMX-30

It should be noted that these modules are intended only to serve as a guide. The use of 35mm slides in the design enables a unit to construct modules to suit their particular training needs. For example, a module made up of the smallest vehicles could be constructed or a module dealing only with personnel carriers could be constructed. The possible combinations are almost endless. Furthermore, as more plastic models become available, the target array can be easily expanded.

Presentation procedures. Each module is composed of three sections. Section A consists of 25 slide presentations, one of each vehicle in each of the five views. During these presentations, the instructor provides the name (or numerical designation), the country of origin, and distinguishing characteristics (that can be seen from the particular view) of each vehicle. Any questions concerning any vehicle are answered at that time. Presentation time for each slide is controlled by the instructor.

Section B consists of 25 slide presentations organized as in Section A, but in a different random order. During each presentation the instructor stresses the most important distinguishing characteristics of each vehicle. However, each presentation is made for only 15 seconds, and questions are not permitted.

Section C is the Final Test for each module. The test consists of five presentations, one randomly selected view of each vehicle. Each target is shown for 8 seconds, and no questions are permitted and no feedback is given.

A module requires between 20 and 25 minutes to complete. Therefore, it will normally be possible to complete two modules during a regular 50-minute class period.

Instructor guide. An instructor guide was designed to insure that the intended procedures are followed. The guide includes a description of the program, a list of the equipment required, procedures for setting up the classroom, outlines for administration (the outlines include a listing of the distinguishing characteristics of each of the vehicles which can be discerned in each particular view), and sample answer sheets for the trainees. Finally, a sample set of instructions to trainees is provided. A copy of all of these materials is provided in the Appendix.

Chapter 3

A SELF-INSTRUCTIONAL PROGRAM IN VEHICLE RECOGNITION/IDENTIFICATION

Introduction

This self-instructional program was originally designed to train participants in the target handoff studies to identify vehicular targets. All too often, the aviator playing the role of the Observation Helicopter (OH) crewman could not identify the designated target for the aviator assuming the role of the Aviation Helicopter (AH) gunner. Lack of identifications and/or misidentifications on the part of the OH crewman undoubtedly increased the handoff time. Similarly, the AH crewman often could not positively identify a target after handoff had been successfully completed. The AH gunners were required to make positive identifications as a part of the procedures. Therefore, prior to the final study, a self-instructional program in vehicle identification was designed to aid both aviators in the handoff process.

Training Program Design

A slide/tape presentation designed for use with a Singer Caramate II was produced. For each vehicle in the program the following types of visual presentations were made.

(a) A closeup photograph of a model taken from the side but slightly above the model. Distinguishing characteristics or features were pointed out with arrows.

(b) A detailed line drawing of the vehicle (taken largely from Army training literature). Again, distinguishing characteristics were pointed out.

(c) A series of photographs of the actual vehicle, some showing only a part of the vehicle. These were copied largely from military literature.

(d) A test slide with four or more vehicles. These slides were photographs of model vehicles in the set taken against a plain background.

(e) A test slide with four or more vehicles shown in a terrain setting. These were made by a montage technique which will be described later.

The accompanying sound track guided the learner through the program, and again pointed out those distinguishing characteristics which could be discerned in each visual presentation. The visual imagery was changed automatically by means of a code on the second track of the tape which was coordinated with the voice track.

Vehicle selection. Originally, the program included only those vehicles which appeared in the target handoff training imagery. The expanded version includes training on the Soviet T-72, T-62, and ZSU 23/4.

Visual imagery. Much of the imagery was copied from training literature. However, the technique for producing the imagery involving the presentation of both friendly and threat vehicles in the same terrain scene was developed for the target handoff research. Essentially, this montage technique involves the following steps.

(a) Photographing model vehicles from various aspect angles and producing hard copy photographs of varying sizes. The vehicles are then carefully cut out.

(b) Selecting a suitable terrain scene. A large number of photographs were obtained of various kinds of terrain at Fort Hood and produced as 35mm slides.

(c) Projecting the terrain scene on a plain white background, and selecting the vehicle cutouts desired. The cutouts are then placed at the desired locations and pasted in place.

(d) Shadows are drawn in as appropriate.

(e) The entire scene is rephotographed and new 35mm slides are made. Different ranges can be simulated by changing the camera-to-screen distance. Different aspect angles can be simulated by the use of two different background photographs of the same terrain scene.

A complete description of this montage technique can be found in a report by Foskett and Ton.[1]

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[1] R. J. Foskett and W. H. Ton. *Development of a photo montage technique for simulation of tactical situations*, HumRRO Final Report FR-WD-TX-78-9, May 1978. (ARI Technical Report, in process.)

Module construction. The original program was contained in a single module which required slightly more than one hour to complete. However, the most recent version contains two modules requiring 40-45 minutes each to complete. The addition of new vehicles plus revisions dictated by experience with the original version added to the overall length of the program. Therefore, the decision was made to package the program into two shorter modules. Each module is self-contained, and requires no instruction to use beyond that necessary to operate the Caramate.

Chapter 4

VEHICLE RECOGNITION AT NIGHT

Introduction

The acquisition of the AN/PVS-5 (CAV NAV) Night Vision Goggles has given Army aviators a 24-hour mission capability. Several studies have shown that even Nap-of-the-Earth (NOE) flight is easily possible with illumination levels equal to that of a quarter-moon or greater.[1] As discussed earlier, the fielding of the TOW weapons system on the AH has given the crew the capability to engage targets at ranges well in excess of 3000 meters. Also, as discussed earlier, near perfect recognition/identification of vehicles is possible at these ranges with the aid of the 13X TOW Sight Unit (TSU), at least during daylight hours. However, the ability of crewmen to recognize and/or identify vehicles at night with the TSU/CAV NAV Goggle combination had not been investigated.

Authorities were concerned that recognition/identification capability would be considerably degraded at night for three reasons. First of all, as with any optical system, there is a considerable loss of light. This loss typically becomes more critical in low levels of illumination. Secondly, considerable resolution is lost by the optical system of the goggles themselves. The goggles provide resolutions in the range of 24 to 28 line pairs/mm.[2] Chastain, *et al.* found that aviators, all of whom had 20/20 or better visual acuity, typically tested at 20/70 or 20/85 while wearing the goggles.[3] Finally, all color vision is lost through the goggles. All objects appear to be green, varying only in brightness. Due to these considerations, authorities requested that research be conducted to determine the effectiveness of the TSU/CAV NAV Goggle combination as a recognition/identification aid at night.

Procedure

Before finalizing the design of the main study, arrangements were made to conduct a pilot study to test the proposed procedures. An AH was oriented in a northerly direction in a comparatively dark area of

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[1] G. B. Stevenson. *Combat air vehicle navigation and vision (CAV-NAV)*, Technical Report No. LWL 74-36, US Army Land Warfare Laboratory, December 1973.

[2] *Ibid.*

[3] G. D. Chastain, W. H. Ton, and A. L. Kubala. *Fatigue effects from wearing the AN/PVS-5 night vision goggles*, HumRRO Final Report FR-WE-TX-78-3, May 1978. (ARI Technical Report, in process.)

the airfield. The TSU was energized by means of an auxiliary power unit. The experimenter, equipped with several HO (1/87) scale model armored vehicles, placed a presentation board in front of the helicopter at a scaled range of 2000 meters (approximately 75 feet). The presentation board consisted of two 12" x 24" plywood panels joined in a right angle along one of their long sides. One panel provided the horizontal surface on which the vehicles were placed, while the other panel formed a vertical background surface behind the vehicles. The panels were covered with papier mache to provide a textured background, and were painted a medium dark forest green. Approximately one hour after sundown, the experimenter placed one of the model armored vehicles on the presentation board. A helicopter pilot, seated in the cockpit, focused the TSU on the model. He was unable to identify the model, so the experimenter moved the presentation board forward in scaled increments of approximately 200 meters (7.5 feet). The pilot was not able to identify the vehicle before it was moved inside the minimum focal range of the system. Therefore, it was concluded that the HO scale was too small for use in this effort.

Two days later, a similar study was conducted using 1/35 scale models. In addition to the pilot, two experimenters and a crew chief served as observers. Again, the study began approximately one hour after sundown. The moon was at 35% of full-moon illumination. However, lights from the airfield, passing aircraft, passing automobiles, and dropped flares resulted in both an increased and somewhat variable illumination level. The same procedures were followed as in the previous attempt. The vehicles were moved forward to a minimum scaled range of approximately 500 meters, but none of the observers was able to even recognize the vehicles at this range. From a side view, it was possible only to determine that the vehicles were tanks. However, from the front, the observers reported that they could not even determine the types of the vehicles. At this point, it was decided that the use of the TSU/CAV NAV Goggle combination for long range vehicle recognition at night would not normally be feasible without artificial illumination.[4] As a result, the main study was cancelled.

Due to time constraints, it was not possible to determine the illumination levels necessary for identification at various ranges. Research on this subject is necessary to aid Army planners in developing doctrine for use of the AH in night operations.

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[4]When the vehicles were illuminated with a flashlight, they could easily be identified at a scaled range of 2000 meters.

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APPENDIX

INSTRUCTOR'S GUIDE

LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

Prepared for 6th US Cavalry Brigade (Air Combat)
Fort Hood, Texas

Prepared by Human Resources Research Organization (HumRRO)
Alexandria, Virginia

(Contract MDA907-78-C-2017 to Army Research Institute (ARI), Fort Hood, Texas)

December 1978

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LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

Introduction

This "Long Range Target Recognition and Identification Training Program" was developed to provide training in armored vehicle recognition and identification at extended ranges (2000-4000 meters) for air cavalry personnel whose duties encompass aerial observation. The program is intended to be more than merely a "threat" program. Its scope was broadened to include US as well as armored vehicles of countries considered to be allied with the United States.

The program is designed as a basic program in recognition and identification. The target audience is intended to be enlisted aerial observers or Attack Helicopter (AH) crewmen, but its use is not limited to those particular groups of air cavalry personnel.

The objectives were developed in a joint meeting between staff personnel from the 6th ACCB S-2 Office, Threat Center personnel, and the ARI/HumRRO research team. The objectives were as follows:

- To develop a modular type training program; each module to be a short complete training block which could be administered within a short time period.
- To provide a training program which would involve a minimum of supportive materials and impose no undue demands on instructor participation.
- To employ the same principles which had been used successfully in experimental studies in "Long Range Target Recognition and Identification."

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To conduct the training in a more realistic fashion by teaching aerial observers to recognize and identify armored vehicles using the same image sizes that would be seen under actual field conditions.

Training Program Design

The program described in this guide consists of six training modules. (See Table 1, page 5.) Each training module contains five different vehicles. Each training module is an independent training unit and can be used alone.

Photographic (35mm) slides of plastic HO scale (1:87) armored vehicles were made showing five different views of each vehicle. The views are: side right (SR), side left (SL), oblique right (OR), oblique left (OL), and front (F). The models were all camouflage painted and were photographed on a terrain model to provide realism.

Each training module is composed of three sections. Section A consists of 25 slide presentations, showing each vehicle in each of the five different views. Vehicles are presented in blocks of five, each block containing all five target vehicles. Views are randomized within each block of vehicles. In Section A, each vehicle is shown once in each of its five views. The trainees will not be aware of the design as the slides are presented with no interruption between each block of five. The presentation of each slide is manually controlled by the instructor. During the presentation of each slide, the instructor will first instruct the trainees to determine whether the vehicle shown is considered to be friendly or a threat, and indicate this by placing an "F" or "T" on their answer sheets. *(NOTE: Sample answer sheets are*

shown later in this guide.) He will also instruct them to name the vehicle if they can. Either the numerical designation or the popular name of the vehicle can be used (e.g., M60, M551, Scorpion, Marder, T-62, etc). If the trainees cannot make these determinations, they also indicate this on their answer sheets. The instructor will then provide the information indicated above, and will also point out distinguishing characteristics or features of the vehicle presented which can be seen from the particular view shown. A list of these characteristics and features is provided for each slide later in this guide. Finally, the instructor will answer any questions, and proceed directly to the next slide. This section is also referred to later in the guide as the "Manual Training Sequence."

Section B consists of 25 slide presentations organized in the same manner as Section A. The presentation sequence is different from that used in Section A, and the slides are only shown for 15 seconds at a time. The changing of slides can be accomplished by means of an automatic timer on the Carousel projector, if this feature is available. Trainees will again be requested to indicate whether each vehicle shown is a friend or a threat, and will name the vehicle if they can. During the last few seconds of each presentation, the instructor will provide the correct answers and other information on the vehicle shown. Lists of the information to be provided are shown later in this guide. This section is also referred to later as the "Automated Training Sequence."

Section C is the Final Test for the module. The test consists of five target presentations. Each vehicle is shown <u>once</u> in only <u>one</u> of its five views. Each vehicle will be shown for only an 8-second duration. No information will be provided the trainees during this test.

Each module normally requires 20-25 minutes to complete. However, more time might be required if the trainees ask an unusually large number of questions.

Vehicle Selection

The vehicles included in the target array were selected by personnel from the S-2 office and Threat Center, 6th ACCB, Fort Hood, Texas. Of the 45 vehicles selected, only 20 were available in an HO scale and could be procured through civilian hobby shops and model stores. Three vehicles which were not available through commercial channels (Soviet T-72, T-62, and ZSU 23/4) were considered to be highly critical, and were handcrafted. Hence, a total of 23 vehicles were employed in constructing an initial set of training modules.

Module Development

The vehicles which make up each module were determined by type of vehicle or size of vehicle. (See Table 1). No attempt was made to organize the vehicles based on friendly or threat status. For example, in Modules 1 through 5, all main battle tanks in the target array were selected and one each was placed in each module. Next, all square-shaped vehicles were selected and one each was distributed in each module. Next, all very small vehicles were selected and one each was distributed in each module. This same selection procedure was continued until the modules were filled with five vehicles. Module 6 was designed

to present a different "test case" of recognition/identification ability. All of the tanks are main battle tanks and, therefore, have many common characteristics.

Table 1. Target Array

Training Module 1	Training Module 4
T-62	AMX-30
BTR-60P	PT-76
Leopard	Scimitar
M113 APC	Marder
Scorpion	T-72
Training Module 2	**Training Module 5**
Centurion	Chieftain
M60A1	ZSU 57/2
Gepard (Flakpanzer)	Jagdpanzer (JPZ 4-5)
AMX-13	T54/55
M109SP	Roland (Marder)
Training Module 3	**Training Module 6**
Chieftain	T-62
M551	M60A1
T54/55	T-72
ZSU 23/4	Leopard
BTR-50	AMX-30

It should be realized that the modules as shown are intended only to serve as an example. Other modules can easily be constructed by simply rearranging the slides, taking care to insure that the arrangements described in the section titled "Training Program Design" are maintained. For example, it would be simple to construct a module including only Soviet vehicles, as seven Soviet vehicles are available in the current array, and any five could be chosen. It would also be

possible to construct a different module (than Module 6 in Table 1) containing only tanks, as the array includes eight tanks. Alternate modules should be constructed to meet the needs of the using military unit.

Training Materials

A kit containing a complet set of slides for each training module has been prepared. An instructor's lesson outline for the modules constructed has also been prepared. This is referred to later as the "Instructor's Copy, Primary Set." These instructor's materials are in outline form, and are intended only to serve as a guide. However, the information provided in the outline for each slide presentation was chosen to point out those identifying characteristics of each vehicle which can be seen from that particular view. Therefore, it is recommended that this material be used. However, the exact words need not be used.

Some "nice-to-know" information is also given in the outline. For example, it is stated that the Soviet PT-76 can achieve a speed of 11 mph in the water. This information is not necessary to identify the vehicle. However, it may be of use from a tactical standpoint. The instructor can delete this type of information or add other similar information in his presentation, depending upon the specific needs of the trainees.

A set of five possible Final Tests for each module has been prepared. The instructor should choose only one of these for each class. The test will have to be prepared by the instructor. That is, he will have to select the slides he wishes to present and place them in the Carousel in the proper order.

Sample copies of trainee answer sheets have also been prepared. These answer sheets can be used with the Primary Set or any Alternate Sets developed for local use.

Finally, a sample set of instructions to trainees has been prepared. This and all of the other materials described above (except the slide kit) are attached to this guide.

Instructional Support Requirements

The program can be conducted in almost any classroom which can be darkened for showing photographic slides. The viewing distance for program development was established at 2500 meters. This range simulation requires 13 feet, 6 inches, from the screen to where the trainees are seated. If ranges beyond 2500 meters are simulated, additional viewing distances will be required and, therefore, larger rooms. (See Table 2, page 10.) A viewing screen, either front or rear projection, will suffice. However, rear projection is recommended for two reasons. First, the projector will not obstruct the trainees' view, and second, sharper images can be obtained on rear projection screens, as they are not beaded. If a screen is not available, one can be assembled by using wooden framing and screen material called "Polacoat." Polacoat is also

usually obtainable from the local Training Aids Service Office (TASO). The size of the viewing area need be no larger than 18" wide by 12" high.

A 35mm Carousel slide projector with a remote handswitch and automatic timer is recommended. The Carousels are easy to load, and slides can be easily rearranged to make new modules. A Kodak Carousel 800 projector with an f:3.5 zoom Ektanar lens (4-8 inches) was employed in developing the program. This type or projector is usually available from the local TASO. The following stock numbers are provided to make it easier to requisition suitable equipment.

- Army Stock No. 6730-00-D00-8961
  Projector, 35mm Carousel Mdl 800
  w/zoom lens
- Army Stock No. 6730-00-P54-6445
  Projector, 35mm Carousel Mdl 850H

Setting the Correct Image Projection Size

Any actual HO scale model which is in the target array can be used. However, the PT-76 and AMX-13 should not be used. The models of these two vehicles which were available at the time the photographs were made were not in exact HO scale. However, the scale was close enough to justify their inclusion in the target array. Nevertheless, to insure proper sizing, one of the projected image, a true HO scale model should be employed.

For purposes of example, let us use the T54/55 tank to illustrate how to perform the sizing. First, measure the length of the tank.

The measurement for length, from the actual model, is 2 7/8 inches, or 7.4 centimeters. (Measurements were made from the front edge of the front fender to the rear edge of the rear fender.) In the center of the viewing screen, place vertically two pieces of tape, with the measurements given above between them. These pieces of tape will be your reference markers. Using either the right or left side view of the T54/55, place the slide in the Carousel projector. Project the image onto the center of the screen. Move the projector toward or away from the screen, focusing for a sharp image, until the projected side view fits exactly between the marker tapes. *(NOTE: Once this is accomplished, the projected image should be the same size as the actual HO scale T54/55 model.)* Sizing accomplished in this manner is the same as using a "choke" reticle for establishing range to a target. This completes the sizing of your projected image. All projected images of the other vehicles will also be properly sized.*

Computing the Viewing Range to the Target

In setting up the scaling for computing the range to target, it was assumed that the target had been detected and the aerial observer was using 7X binoculars to aid in recognizing and identifying the target vehicle. Using the distances in Table 2, the projected image would be

*The sizing method described should not be used for front projection on a beaded screen, as the adhesive on the tape will be difficult to clean off the screen. With front projection, a piece of white paper with lines marked to the correct distance apart should be held firmly against the screen by an assistant. The instructor should then adjust the image to fit between the lines.

the same size as the real vehicle seen through binoculars at the ranges simulated.

Table 2. Range Simulation Distances
(based on 7X binoculars)

Distance From Viewing Screen to Trainee's Seat	Simulated Range* (meters)
5 feet, 5 inches	1000
8 feet, 1 inch	1500
10 feet, 9 inches	2000
13 feet, 6 inches	2500
16 feet, 2 inches	3000
18 feet, 10 inches	3500
21 feet, 7 inches	4000

*The distance-to-range ratio is approximately 5 feet, 4 21/32 inches per 1000 meters of range.

This training program allows the instructor the flexibility of simulating viewing of the targets using 13X optics, 7X optics, or using unaided vision. It is accomplished by computing what the image size would be if viewed at any specified range, then mathematically computing what distance the trainee must be from the viewing screen so that the projected image appears the same size as if viewed under actual field conditions at that range. This does not affect the initial sizing of the image as described before.

Below are three examples of how the viewing distance for a particular range is computed. In each case it has been assumed that the image has been sized according to the previous instructions. That is, "Size of image" is the same as "Actual size" of the HO model. Therefore, the fraction $\frac{\text{Size of image}}{\text{Actual size}}$ is equal to one. For example, in the case of the T54/55 tank, the fraction would be 7.4 cm ÷ 7.4 cm = 1.

1. Using 13X optics (such as the COBRA TSU Sight)

Equation: $\frac{\text{Size of image}}{\text{Actual size}} \times \frac{\text{Range in Meters}}{345} = \text{Distance From Screen}$

Example: Let's assume that we want the projected image size on the screen to be the same size as a vehicle actually viewed at 2000 meters. Here is how we would compute it:

(1) x (2000 m ÷ 345) = 5.8 feet.

5.8 feet is the distance from the screen the trainees would have to be to simulate looking at a vehicle at 2000 meters.

2. Using 7X optics (such as binoculars)

Equation: $\frac{\text{Size of image}}{\text{Actual size}} \times \frac{\text{Range in Meters}}{186} = \text{Distance From Screen}$

Example: Let's assume that we want the projected image size on the screen to be the same size as a vehicle actually viewed at 2000 meters. Here is how we would compute it:

(1) x (2000 m ÷ 186) = 10.8 feet.

10.8 feet is the distance from the screen the trainees would have to be to simulate looking at a vehicle at 2000 meters.

3. Using unaided vision (naked eye)

Equation: $\frac{\text{Size of image}}{\text{Actual size}} \times \frac{\text{Range in Meters}}{26.5} = \text{Distance From Screen}$

Example: Let's assume that we want the projected image size on the screen to be the same size as a vehicle actually viewed at 2000 meters. Here is how we would compute it:

(1) x (2000 m ÷ 26.5) = 75.5 feet.

75.5 feet is the distance from the screen the trainees would have to be to simulate looking at a vehicle at 2000 meters.

As you can see, at 75.5 feet, the projected image would appear very small.

The three equations given have been somewhat simplified for ease of computation. If a different optical power than those shown needs to be simulated, a different equation must be employed. The following equation can be employed in those cases to compute the viewing distance:

$$\text{Distance} = \frac{\text{Size of image}}{\text{Actual size}} \times \frac{(\text{Range in meters}) \times (3.2808)}{(\text{power of optic}) \times (87)}$$

Using these equations and examples, the instructor can compute a multitude of ranges and vary the viewing distance to simulate any optical devices that are employed in helicopters as well as armored vehicles.

Setting-up the Carousel 35mm Slide Trays

Each training module has two complete training sequences furnished with the instructional material. These sequences are titled "Primary" and "Alternate" sets. Once the instructor selects the sequence he wants to use, he then selects those slides specified for that particular module(s) and loads them in the slide tray according to the sequence specified in the set chosen.

The instructor must also select one of the five Final Test sequences he wants to administer. These are loaded in the slide tray, allowing several empty spaces between the end of Section B (Automated Sequence) and the beginning of the first Final Test slide.

If enough extra slide trays and slides can be obtained, the slides for each training module can be loaded and left in the Carousel trays. This would greatly facilitate the arranging of the slides and cut down on training preparation time by the instructor.

Use of the Training Module Outlines

These are called "outlines" rather than "lesson plans" as it was not the intention of the training program developers to make the instructors follow exactly every word that has been provided. It was hoped that the instructors would use the outlines as a basis to develop other modules and as a guide in presenting the instruction. A complete lesson outline has been provided only for the Primary Set. The outline material for the Primary Set contains all the necessary information to develop outlines for Alternate Sets. It should require nothing more than a cut-and-paste effort with slight modification to the written portions due to vehicle sequences being different between the sets.

SAMPLE INSTRUCTIONS TO TRAINEES

With all of the technological sophistication we have at our disposal, the most reliable means of recognition and identification is still performed by the human eye, sometimes aided by visual devices.

Weapon development is constantly increasing the ranges at which we can engage. Ranges of 3000 and 4000 meters are common. As our engagement ranges increase, the ability to recognize and identify friend from threat becomes more and more difficult. The job of the aerial observer becomes much more important. We must be able to identify positively whether a target is in fact a threat.

On the modern, very fluid battlefield where large forces intermingle, the difference between recognizing and identifying friend from threat may well mean life or death for the crew of a helicopter or armored vehicle.

One of the problems that has faced the military in the past, as well as the present, is the inability of every soldier to be able to differentiate rapidly between friend and threat. Friendly doesn't always mean your own forces, but can also mean military forces of an allied country. We sometimes forget that their armored vehicles look much different than our own and sometimes resemble very closely those vehicles of nations we consider to be possible threats to our country.

To illustrate my point: There was a picture published in some military magazines taken after a battle between Israeli and Arab forces. The picture showed clearly an Arab tank with a hole punched through the

rear of the turret. The hole showed clearly that the tank was knocked out by a finned projectile. The Arab army was the only army using finned projectiles. They had knocked out their own tank.

You may feel that this happened simply because the Arabs were not well trained in vehicle identification. Unfortunately, the research that led to the development of this training program showed that many US soldiers also were not adequately trained. Some of the deficiencies of current conventional training programs were found to be:

1. They do not habitually teach observers to recognize or identify armored vehicles at ranges of 2500 meters or more, yet, these longer ranges are where the threat vehicles are most likely to be first seen.

2. They do not always show the vehicles painted in camouflage patterns. Also, the background many times is quite different than would be found in a real battlefield situation.

3. Teaching emphasis is on recognizing and identifying threat vehicles. As a result, a fairly large number of our soldiers have difficulty telling whether our own vehicles, and those of our allies, are friends or threats at extended ranges.

4. Lastly, the conventional programs stress vehicle features and charactersitics which, at extended ranges, frequently can't be seen at all. At standoff ranges of 3000-4000 meters, both friendly and threat armored vehicles subtend very small visual angles--approximately three to four minutes of arc--when viewed by the unaided eye. Even with the 13X optic of the COBRA-TOW weapons sight, images of armored vehicles are still so small that only gross target features are clearly recognizable.

A further complication arises from the similarity between friendly and threat vehicles in terms of shape, overall physical dimensions, and location of external items such as bore evacuators, machineguns, and a number of other features.

The training program you will be taking today is designed to provide you with training that is more realistic in terms of actual field conditions. You will be trained to recognize and identify armored vehicles, using only those cues that you would actually see at extended ranges. At this time it is appropriate to define the terms "Recognition" and "Identification." Recognition is being able to state whether the vehicle being shown is what we consider to be from a "friendly" or a "threat" nation. Identification is to label the vehicle being shown by its correct model number or its most common name.

The image sizes of each vehicle have been computed to approximate the actual size you would see at the actual viewing ranges using 7X binoculars. By varying the distance from your seat to the screen, we can simulate any reasonable and practical range to target.

All targets that you'll see have been photographed as if you were viewing the vehicle from a helicopter at a downward angle of approximately 10 degrees. This also provides more realism in the training than conventional training programs.

Before I give you the instructions on the procedures that we will follow, I would like to emphasize that you will be tested only on your ability to recognize and identify the various target vehicles. Comments regarding weight, caliber of weapon, crew composition, etc., are intended to relieve monotony and make the program interesting to you.

Are there any questions?

I would now like to review the procedures we'll follow.

The training program is composed of training modules, each module independent of all other modules. The target array for each module consists of five different armored vehicles. You will see each vehicle in five different views:

1. Side Right
2. Side Left
3. Oblique Right
4. Oblique Left
5. Front

Each module is divided into three sections:

1. Section A is a "Manual Training Sequence." By this, I mean I will control the presentation of each slide. Each vehicle will be thoroughly discussed and you will get immediate feedback on whether you have correctly or incorrectly recognized or identified the vehicle being shown.

2. Section B is an "Automated Training Sequence." Each slide will be shown for 15 seconds and will then change automatically. I will provide comment the same as in Section A.

3. Section C is the "Fin[illegible] Test" for the module. You will only be tested on your ability to recognize and identify each vehicle. Nothing else. Each slide will be presented for 8 seconds and will then change automatically.

I will review each test slide with you after the answer sheets and work sheets have been collected.

If you'll look at the handout that's been provided you, you will see that the first page requests background information. This information is required so that you can be identified and located. Please fill out the sheet, and PLEASE PRINT. I'll talk you through it and answer any questions.

The second page is the work sheet for the Manual Training Sequence. Let's look at the example at the bottom of the page. These are five of the most common types of responses that you'll make.

Each time I show a slide, I want you to show whether the vehicle is a friend or a threat by placing an "F" or a "T" in the blank by the trial number. If you don't know, either write "Don't know," or just "DK." Next, I want you to name the vehicle if you can. Either the numerical designation or the common name will do. For example, I don't care whether you call the M551 by that designation or whether you call it a Sheridan. Again, if you don't know, indicate that in the column under "Vehicle Description." Notice in the example that it is alright to call a vehicle a friend or a threat, even if you don't know the name. Any questions on how to complete the Answer Sheets? (ANSWER ANY QUESTIONS BEFORE GOING ON.)

Alright, you will notice that this second page is called "Section A: Manual Training Sequence." Each time I show a slide I want you to fill in the blanks in the way I just described. After you have had time to record your answers, I'll tell you the name of the vehicle, whether it is a friend or a threat, and will point out some features that will help you distinguish that particular vehicle from others. I will also answer any questions about the vehicle.

Now, look at the third page, note that it is called "Section B: Automated Training Sequence." We will do the same things we did in Section A, except that I will not answer any questions this time. Also, each slide will only be shown for 15 seconds.

Now, look at the last page. This is called "Section C: Final Test." During this portion each slide will be shown for only 8 seconds. I will not give you any information or answer any questions during this part. However, after I have collected your answer sheets, I will be glad to discuss any part of the training with you.

Now, before we begin, notice that in the upper right hand corner of each of the four sheets, there is a blank for Module Number. Please write the number ___ in that space on all four sheets. (TELL THE TRAINEES WHICH MODULE NUMBER TO PUT IN THE BLANK. IT IS NOT NECESSARY TO START ALL TRAINEES WITH MODULE 1. HOWEVER, IT IS RECOMMENDED THAT MODULE 6 BE PRESENTED LAST.)

If there are no further questions, we'll begin the training.

MODULE 1: TARGET ARRAY
T-62
M113
BTR-60P
Leopard
Scorpion

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 1

Section A: Manual Training Sequence

Trial	Vehicle	View
1	T-62	SL
2	Leopard	SR
3	M113	F
4	Scorpion	OL
5	BTR-60P	OR
6	Leopard	F
7	M113	OL
8	Scorpion	OR
9	BTR-60P	SL
10	T-62	SR
11	M113	OR
12	Scorpion	SL
13	BTR-60P	SR
14	T-62	F
15	Leopard	OL
16	Scorpion	SR
17	BTR-60P	F
18	T-62	OL
19	Leopard	OR
20	M113	SL
21	BTR-60P	OL
22	T-62	OR
23	Leopard	SL
24	M113	SR
25	Scorpion	F

MODULE 1: TARGET ARRAY
T-62
M113
BTR-60P
Leopard
Scorpion

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 1

Section B: Automated Training Sequence

Trial	Vehicle	View
26	Leopard	F
27	M113	OL
28	Scorpion	OR
29	BTR-60P	SL
30	T-62	SR
31	M113	OR
32	Scorpion	SL
33	BTR-60P	SR
34	T-62	F
35	Leopard	OL
36	Scorpion	SR
37	BTR-60P	F
38	T-62	OL
39	Leopard	OR
40	M113	SL
41	BTR-60P	OL
42	T-62	OR
43	Leopard	SL
44	M113	SR
45	Scorpion	F
46	T-62	SL
47	Leopard	SR
48	M113	F
49	Scorpion	OL
50	BTR-60P	OR

MODULE 1: TARGET ARRAY
T-62
M113
BTR-60P
Leopard
Scorpion

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 1

Section C: Final Tests (Automated)*

	Trial	Vehicle	View
Test I			
	1	M113	OR
	2	Scorpion	SL
	3	BTR-60P	SR
	4	T-62	F
	5	Leopard	OL
Test II			
	1	Scorpion	SR
	2	BTR-60P	F
	3	T-62	OL
	4	Leopard	OR
	5	M113	SL
Test III			
	1	BTR-60P	OL
	2	T-62	OR
	3	Leopard	SL
	4	M113	SR
	5	Scorpion	F
Test IV			
	1	T-62	SL
	2	Leopard	SR
	3	M113	F
	4	Scorpion	OL
	5	BTR-60P	OR
Test V			
	1	Leopard	F
	2	M113	OL
	3	Scorpion	OR
	4	BTR-60P	SL
	5	T-62	SR

*Instructor will use only 1 of 5 possible Final Tests for this Module. Test should be chosen at random.

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 1

Section A: Manual Training Outline

Trial 1: T-62, SL

- Threat, Soviet, T-62 Tank.
- Its most distinctive feature is the overturned, cup-shaped turret.
- Note that the turret is centered on the hull. This type of turret is characteristic of all modern Soviet battle tanks.
- The main gun is relatively long in relationship to the length of the hull.

Trial 2: Leopard, SR

- Friendly, West German, Leopard A4 Tank.
- The feature that stands out from a side view is the boxy (squared) shape.
- Its most distinctive feature is the scalloped skirts.
- The rather rectangular and elongated turret.
- The squared, or bobbed, rear of the vehicle.
- Note the large number of roadwheels (7).
- Note the searchlight. If it is mounted, this cue may help in identifying the vehicle, but do not rely on it, as it can be stowed or may not even be carried on the tank.

Trial 3: M113 APC, F

- Friendly, American, M113 APC.
- The most distinctive feature is its square shape.
- The caliber .50 machinegun is seen in this slide as a dark, raised projection. Do not rely on this cue, as the weapon can be dismounted.
- Keep in mind that the shape is a high square rather than a low square. You will see other types of personnel carriers later on. They all tend to have a square, or boxy, shape.

Trial 4: Scorpion, OL

- Friendly, British, Scorpion, Light Tank.
- Its most distinctive feature in this view is the turret which sets at the rear of the vehicle.
- Note that you cannot see the main gun.
- The turret is cleft at the front.
- Note the very long, gradual slope from the front of the vehicle up to the turret.

Trial 5: BTR-60P, OR

- Threat, Soviet, BTR-60P. Personnel Carrier.
- The 3 most distinctive features are:

    1. 4 large wheels per side,
    2. downward sloping all-around armor,
    3. duck-billed amphibious prow,
    4. boat-shaped body.

- It has an open top and carries a 2-man crew and 14 passengers.
- The vehicle has a boat-shaped hull.

Trial 6: Leopard, F

- Friendly, West German, Leopard Tank.
- High, narrow box shape.
- Distinctive sharp side slopes on the turret.
- Note how well the searchlight blends in with the turret in this view.

Trial 7: M113 APC, OL

- Friendly, American, M113 APC.
- In this view the caliber .50 machinegun can be readily seen.
- The skirting over the roadwheels is another characteristic of this vehicle.
- Note the sharply angled front slope to the vehicle.

Trial 8: Scorpion, OR

- Friendly, British, Scorpion, Light Tank (76mm gun).
- It has a 3-man crew (tank commander, gunner, and driver).
- Turret at the rear.
- At the front of the vehicle is a small angled short skirt.
- What looks like a tube just above the track is part of the decking.
- Note that the main gun cannot be seen.

Trial 9: BTR-60P, SL

- Threat, Soviet, BTR-60P, Personnel Carrier.
- Remember the 4 basic characteristics:

1. downward sloped all-around armor,
2. 4 large wheels on each side,
3. duck-billed (sharply angled) prow,
4. boat-shaped body.

Trial 10: T-62, SR

- Threat, Soviet, T-62 Tank.

- Again, note the dome-shaped, centrally located turret.

- The bore evacuator on this tank is mounted a little way back from the front of the gun tube. At far ranges the evacuator can't be seen.

- The T-62 has grabrails located midway across the turret. In some pictures you can see them, in others you cannot.

- Note the gap in the roadwheels. The space between these two roadwheels is wider than the others. I want you to remember that on the T-62, the gap is located toward the rear of the track. Remember, in the T-62 the gap is to the rear. You will see why this is significant when we compare the T-62 to other Soviet tanks.

Trial 11: M113 APC, SR

- Friendly, American, M113 APC.

- Remember these 3 characteristics:

    1. large box shape,
    2. very sharpy angled front slope,
    3. skirts which effectively hide the roadwheels.

Trial 12: Scorpion, SL

- Friendly, British, Scorpion, Light Tank.

- Here, you can see clearly the partial skirt in the front.

- The main gun can be seen in this view. It's a short gun tube.

- Note that the turret comes directly even with the rear of the hull.

- It also has the long gradual front slope leading up to the gun. The driver's hatch is located on the slope in front of the turret.

- It has 5 roadwheels and 1 tucked up under the rear decking.

Trial 13: BTR-60P, SR

• Threat, Soviet, BTR-60P, Personnel Carrier.

• In other models the top is closed over for better prodection from overhead fire.

• There are 3 vehicles which carry the designation of BTR-60. They all look alike. The one in this slide has an open top. Another carrier has an enclosed armored top, and a third vehicle is closed over and has a small machinegun turret at the front of the vehicle. Although there are many differences, all three look like the vehicle you see here.

• All of these vehicles have 4 main characteristics in common:

1. large wheels,
2. sloped all-around armor,
3. boat-shaped hull,
4. amphibious prow in front (duck-billed).

Trial 14: T-62, F

• Threat, Soviet, T-62 Tank.

• This is the most difficult view, so take a good look at it.

• Note the sharp prow line, the extremely low silhouette, and the dome-or cup-shaped turret.

• In this slide you can see one of the IR searchlights with which this tank is equipped. Do not depend on this cue, but simply use it as a reinforcer along with the other vehicle characteristics.

Trial 15: Leopard, OL

• Friendly, West German, Leopard Tank.

• In this slide we can see the grill doors on the rear of the vehicle. There is also a grill on the other side of the vehicle.

• Note the scalloped skirting, and rather compact body shape, with a lot of roadwheels showing.

• Also note what appears to be a very sharp angle at the front of the turret.

• Note the very thick section between the bottom of the turret and the visible portion of the roadwheels.

Trial 16: Scorpion, OR

- Friendly, British, Scorpion, Light Tank.
- Its small apparent size as compared to other vehicles and the turret on the rear tells you that it is a Scorpion, Friendly, British Light Tank.

Trial 17: BTR-60P, F

- Threat, Soviet, BTR-60P, Personnel Carrier.
- Looks similar to the front view of the M113 APC, doesn't it? The major difference is the wedge-shaped prow. Note the large shadow area and the sloped armor.
- The stud showing is the machinegun and machinegun pedestal mount.
- Another feature to remember, that differentiates it slightly from the M113 APC (front view), is the slightly shaped sides rather than being squared like the M113.

Trial 18: T-62, OL

- Threat, Soviet, T-62 Tank (115mm gun).
- In this view we get a better look at how the front armor is sloped.
- Note that the edge of the prow is very low to the ground.
- Keep in mind the turret slope and centered turret.
- It has 5 roadwheels with the gap toward the rear.
- You can see the searchlight and what looks like a machinegun.

Trial 19: Leopard, OR

- Friendly, West German, Leopard Tank.
- In this picture we can see clearly the length of the main gun.
- Also note the heavy gun mantle or glacis.
- The dark bar on the side of the turret is the smoke grenades.

Trial 20: M113, SR

- Friendly, American, M113 APC.
- By this time you should know that the armored box is the American M113 APC.

Trial 21: BTR-60P, OL

- Threat, Soviet, BTR-60P. Personnel Carrier.
- Looks like a large beetle or water-bug.
- The unique prow and big wheels, along with the weapon sticking up in front, lets us know this is a Soviet BTR-60P.

Trial 22: T-62, OR

- Threat, Soviet, T-62.
- By this time you should know the main features of the T-62.
- You can see the handrails and searchlight; note that the shadow hides the roadwheels.
- I would like to point out some very minor features. First, the smooth gradual front slope; and second, the smooth taper of the top of the turret.

Trial 23: Leopard, SL

- Friendly, West German, Leopard Tank.
- The main distinguishing feature is the squarish lines which characterize the whole tank (square grills, square end, and square turret lines).

Trial 24: M113 APC, SR

- Friendly, American, M113 APC.
- Do I need to say which this is? (WAIT FOR CLASS RESPONSE)
- Yes, it's the M113 APC.

Trial 25: Scorpion, F

- Friendly, British, Scorpion, Light Tank.
- In this slide you can see the very long, low front slope leading to the turret.
- Note the pillbox-shaped turret with its cut edges.
- Look how low the front edge of the prow is to the ground.
- The vehicle's all over size is quite a bit shorter than most other vehicles.
- This vehicle is used in British reconnaissance units.

Section B: Automated Training Outline

(15 second duration for each slide)

Trial 26: Leopard, F

- Friendly, West German, Leopard Tank.
- The sharp cut side of the turret front and high prow line may help you in identifying this vehicle.

Trial 27: M113, OL

- Friendly, American, M113 APC.
- The square, boxed appearance is its foremost feature.

Trial 28: Scorpion, OL

- Friendly, British, Scorpion, Light Tank.
- Low and small, with the turret at the rear.
- It has exceptional mobility and a hard-hitting 76mm gun.

Trial 29: BTR-60P, SL

- Threat, Soviet, BTR-60P, Personnel Carrier.
- Boat-shaped hull and big wheels stand out.

Trial 30: T-62, SR

- Threat, Soviet, T-62 Tank.
- Cup-shaped, centered turret is characteristic of Soviet tanks.
- Has 5 roadwheels in a Christie-type suspension.

Trial 31: M113, OR

- Friendly, American, M113 APC.
- Need I tell you? M113 APC.
- An excellent vehicle. It's been around since the late 1950s.

Trial 32: Scorpion, SL

- Friendly, British, Scorpion, Light Tank.
- Note the short barrel; doesn't even reach the front of the vehicle.
- Turret flush with the rear.

Trial 33: BTR-60P, SR

- Threat, Soviet, BTR-60P, Personnel Carrier.
- Newer model has an enclosed top.
- Look for the all-around sloping armor.

Trial 34: T-62, F

- Threat, Soviet, T-62 Tank.
- Presents a very low profile in the front view.

Trial 35: Leopard, OL

- Friendly, West German, Leopard Tank.
- The turret sets slightly forward on the tank and has sharply angled armor.

Trial 36: Scorpion, SR

- Friendly, British, Scorpion, Light Tank.
- It has a Jaguar 6-cylinder engine and gives off a very recognizable noise signature.
- Has a built-in flotation screen which the crew can erect for water crossings.

Trial 37: BTR-60P, F

- Threat, Soviet, BTR-60P, Personnel Carrier.
- The front shaped like the bow of a boat is a major feature of this vehicle.

Trial 38: T-62, OL

- Threat, Soviet, T-62 Tank.
- It has 4 crew members.
- Note the line running across the front slope.

Trial 39: Leopard, OR

- Friendly, West German, Leopard Tank.
- Mounts a 105mm gun.
- It has a 7.62mm that can be mounted either on the commander or loader's hatch.

Trial 40: M113, SL

- Friendly, American, M113 APC.
- Some models in Vietnam incorporated an armored turret. In this configuration the commander is very vulnerable while firing the caliber .50 machinegun.

Trial 41: BTR-60P, OL

- Threat, Soviet, BTR-60P. Personnel Carrier.
- This vehicle was introduced in the early 1960s. Looks much like an American vehicle called the "Commando."

Trial 42: T-62, OR

- Threat, Soviet, T-62 Tank.
- Came out in 1961.
- Diesel powered.

Trial 43: Leopard, SL

- Friendly, West German, Leopard Tank.
- Scalloped skirts and square grills on the back.

Trial 44: M113, SR

- Friendly, American, M113 APC.
- Our mechanized infantry are mounting the TOW antitank system on this vehicle.

Trial 45: Scorpion, F

- Friendly, British, Scorpion, Light Tank.
- This vehicle is one of a whole family using the same basic chassis.

Trial 46: T-62, SL

- Threat, Soviet, T-62 Tank.
- The larger spacing is between the 3rd and 4th and 4th and 5th roadwheels. The first three roadwheels are much closer together.

Trial 47: Leopard, SR

- Friendly, West German, Leopard Tank.
- It has 7 roadwheels.

Trial 48: M113, F

- Friendly, American, M113 APC.
- The steep front slope helps in identification from the front.

Trial 49: Scorpion, OL

- Friendly, British, Scorpion, Light Tank.
- A light tank used in British recon units.
- Can also be mounted with the Swingfire AT missile.
- Performs well over muddy or marshy ground due to its light weight and low ground pressure.

Trial 50: BTR-60P, OR

- Threat, Soviet, BTR-60P, Personnel Carrier.
- Carries a crew of 2 plus 14 infantrymen.
- Can swim at about 6 mph.

STUDENT PERSONAL INFORMATION, WORK SHEETS, AND ANSWER SHEET

PRIMARY & ALTERNATE SETS
Date: _____
Module No. _____

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

Modules 1-6

PERSONAL INFORMATION

1. Name: _____ (Last) _____ (First) _____ (MI)

2. Rank: _____ 3. ASN: _____

4. Age: _____ 5. Military Unit: _____ _____

6. Time in Service: _____ (Years) _____ (Months)

7. MOS: _____

8. Length of Time in MOS: _____ (Years) _____ (Months)

9. What is the MOS of the job to which you are currently assigned?

_____

10. Do you wear glasses? Yes ___ No ___

(If you checked YES, complete 10a and 10b below.)

10a. Should you wear glasses on the job? Yes ___ No ___

10b. Do you wear glasses only for reading? Yes ___ No ___

Primary & Alternate Sets
Module No. _____

STUDENT WORK SHEET

MODULES 1-6

Section A: Manual Training Sequence

Trial	Friend/ Threat	Vehicle Description	Trial	Friend/ Threat	Vehicle Description
1	_____	_____	14	_____	_____
2	_____	_____	15	_____	_____
3	_____	_____	16	_____	_____
4	_____	_____	17	_____	_____
5	_____	_____	18	_____	_____
6	_____	_____	19	_____	_____
7	_____	_____	20	_____	_____
8	_____	_____	21	_____	_____
9	_____	_____	22	_____	_____
10	_____	_____	23	_____	_____
11	_____	_____	24	_____	_____
12	_____	_____	25	_____	_____
13	_____	_____			

EXAMPLE OF NORMAL RESPONSE:

Trial	Friend/ Threat	Vehicle Description
1	F	Swedish S-Tank
2	T	BRDM Armored Car
3	F	Don't know (DK)
4	T	Don't know (DK)
5	Don't know	Don't know

STUDENT WORK SHEET

MODULES 1-6

Section B: Automated Training Sequence

Trial	Friend/ Threat	Vehicle Description	Trial	Friend/ Threat	Vehicle Description
26	_____	_____	39	_____	_____
27	_____	_____	40	_____	_____
28	_____	_____	41	_____	_____
29	_____	_____	42	_____	_____
30	_____	_____	43	_____	_____
31	_____	_____	44	_____	_____
32	_____	_____	45	_____	_____
33	_____	_____	46	_____	_____
34	_____	_____	47	_____	_____
35	_____	_____	48	_____	_____
36	_____	_____	49	_____	_____
37	_____	_____	50	_____	_____
38	_____	_____			

Primary & Alternate Sets
Module No. _____

STUDENT ANSWER SHEET

MODULES 1-6

Section C: Final Test (Automated)

(8-second exposure)

Trial	Friend/Threat	Vehicle Description
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____

MODULE 2: TARGET ARRAY
M60A1
Gepard
M109
Centurion
AMX-13

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 2

Section A: Manual Training Sequence

Trial	Vehicle	View
1	Centurion	SR
2	M60A1	F
3	Gepard	OL
4	AMX-13	OR
5	M109	SL
6	M60A1	OL
7	Gepard	OR
8	AMX-13	SL
9	M109	SR
10	Centurion	F
11	Gepard	SL
12	AMX-13	SR
13	M109	F
14	Centurion	OL
15	M60A1	OR
16	AMX-13	F
17	M109	OL
18	Centurion	OR
19	M60A1	SL
20	Gepard	SR
21	M109	OR
22	Centurion	SL
23	M60A1	SR
24	Gepard	F
25	AMX-13	OL

MODULE 2: TARGET ARRAY
M60A1
Gepard
M109
Centurion
AMX-13

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 2

Section B: Automated Training Sequence

Trial	Vehicle	View
26	M60A1	OL
27	M109	F
28	AMX-13	OR
29	Centurion	SL
30	Gepard	SR
31	AMX-13	SL
32	M60A1	OR
33	Centurion	SR
34	Gepard	F
35	M109	OL
36	Centurion	F
37	AMX-13	SR
38	Gepard	OL
39	M109	OR
40	M60A1	SL
41	Gepard	OR
42	Centurion	OL
43	M109	SL
44	M60A1	SR
45	AMX-13	F
46	M109	SR
47	Gepard	SL
48	M60A1	F
49	AMX-13	OL
50	Centurion	OR

MODULE 2: TARGET ARRAY
M60A1
Gepard
M109
Centurion
AMX-13

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 2

Section C: Final Tests (Automated)*

	Trial	Vehicle	View
Test I			
	1	Gepard	OR
	2	Centurion	OL
	3	M109	SL
	4	M60A1	SR
	5	AMX-13	F
Test II			
	1	M109	SR
	2	Gepard	SL
	3	M60A1	F
	4	AMX-13	OL
	5	Centurion	OR
Test III			
	1	M60A1	OL
	2	M109	F
	3	AMX-13	OR
	4	Centurion	SL
	5	Gepard	SR
Test IV			
	1	AMX-13	SL
	2	M60A1	OR
	3	Centurion	SR
	4	Gepard	F
	5	M109	OL
Test V			
	1	Centurion	F
	2	AMX-13	SR
	3	Gepard	OL
	4	M109	OR
	5	M60A1	SL

*Instructor will use only 1 of 5 possible Final Tests for this Module. Test should be chosen at random.

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 2

Section A: Manual Training Outline

Trial 1: Centurion, SR

- Friendly, British, Centurion Tank.
- This vehicle has 3 major features which make it distinctive:

1. The very large skirts which almost completely cover the roadwheels. Note the large upward slope at the rear.

2. The turret sets well forward on the hull and is comparatively small for a medium tank.

3. The turret has a decided overhang at the rear and the sides of the turret project outward, resembling elephant ears. You will see this feature better in the other slides.

- You can barely see the bore evacuator located slightly forward of the midpoint of the main gun.

Trial 2: M60A1, F

- Friendly, American, M60A1 Tank.
- In this particular slide, at first glance, it looks much like a Soviet tank.
- You're probably used to seeing the very prominent commander's cupola on the left of the vehicle. Do not depend on it as your only cue. Shown here, the cupola is very difficult to see.
- Note the sharp prow line and the characteristic sharp, flat, angled surfaces at the front of the turret. When this turret first came out it was called "needlenosed." You'll see more of it.
- The relative overall large size of the M60A1 makes it stand out when compared to other vehicles. It stands fairly high in comparison to Soviet tanks. All modern Soviet tanks are built extremely low.

Trial 3: Gepard, OL

• Friendly, West German, Gepard (Flakpanzer), Air Defense System (twin guns).

• Major features are:

1. The scalloped skirts which seem to be characteristic of West German design. Their main battle tank (Leopard) has them also.

2. The high squared turret with the large pods which are the pivotal point for the guns.

• In this slide you can see fairly clear the rather large radar dish above the turret rear. The other radar dish is at the front of the turret and in this slide blends in with the turret.

• Almost all frontline air defense systems employ some form of radar dish (except the Soviet ZSU 57-2). Do not rely on them, as at extended ranges they tend to fade out.

• You may want to note the large number of roadwheels as compared to other vehicles (it has 7).

Trial 4: AMX-13, OR

• Friendly, French, AMX-13, Light Tank.

• It's a funny looking vehicle. It's characterized by its smallness; a turret which is very small and well sloped in front, long slender main gun, and large slender turret overhang.

• Turret position is well to the rear of the vehicle.

Trial 5: M109 SP, SL

• Friendly, American, M109 SP (155mm gun).

• Its size and high straight armor, plus large thick gun ending in a webbed muzzle brake, identify it rapidly as a self-propelled artillery weapon.

• The large turret compartment taking up over half of the hull area and situated to the rear of the vehicle helps in identifying it.

• Note the caliber .50 machinegun.

Trial 6: M60A1, OL

- Friendly, American, M60A1 Tank (105mm gun).

- The first thing that strikes you in this view is the rather large turret. The turret armor is not rounded but retains a flat surface look.

- The suspension uses roadwheels with support rollers over which the top of the track rolls.

- You can barely see the cupola.

- The turret is fairly well centered and takes up a large volume of space when compared to the hull size.

Trial 7: Gepard, OR

- Friendly, West German, Gepard, Air Defense Weapon.

- The shape is bulky and extremely unique when compared with other armored vehicles. Only two other vehicles, which are Soviet, even closely resemble it.

- The top radar, which you can barely make out, is the acquisition radar and the one in front is the tracking radar.

- Keep in mind the scalloped skirts.

Trial 8: AMX-13, SL

- Friendly, French, AMX-13, Light Tank.

- The shape and small size make this vehicle easy to remember. The French use the letters AMX for a number of different vehicles. It's the number 13 that makes this one unlucky.

Trial 9: M109 SP, SR

- Friendly, American, M109 SP, Artillery Weapon.

- Your biggest problem will be to remember the model number M109. All self-propelled artillery weapons have a large number of characteristics common to each other.

- Take a good look at its shape.

Trial 10: Centurion, F

- Friendly, British, Centurion Tank.
- Even though they are hard to see in this slide, the ears (stowage boxes) on the turret make the vehicle easily distinguishable from other tanks.
- The turret appears to be very low from this view.
- Notice the high prow line and large shadowed area.

Trial 11: Gepard, SL

- Friendly, West German, Gepard (Flakpanzer).
- By this time you should only be having difficulty, if any, with the name G-E-P-A-R-D.
- If the grill doors on the rear look familiar, they should, the chassis is the same as that which is used on the West German main battle tank.

Trial 12: AMX-13, SR

- Friendly, French, AMX-13, Light Tank.
- In this slide you can see the turret very clearly.
- Note the smooth, rounded, sloping front armor of the turret.
- Also note the low, flat, bar-like overhang.
- I would like to point out how hard it is to count the roadwheels at this distance. The number of roadwheels is sometimes helpful as a cue, but distance and shadow tend to obscure them. The type of suspension may help you at times. In this slide the roadwheels take up most of the space between the ground and the top of the deck.

Trial 13: M109, F

- Friendly, American, M109 SP.
- One characteristic which may help you is the massiveness of the gun.
- Another is the rectangular turret armor.
- The overall shape is very long.
- The machinegun at the left may also help you.

Trial 14: Centurion, OL

- Friendly, British, Centurion Tank.
- The turret shape and skirting are easily recognizable.
- Note the high prow line; not a lot of slope leading up to the turret.

Trial 15: M60A1, OR

- Friendly, American, M60A1 Tank.
- The suspension design and large turret area should help you in identifying this vehicle.
- Pay particular attention to the very high turret lines; the cupola adds to that height.
- The relative size of the turret and hull are proportional (same size roughly).

Trial 16: AMX-13, F

- Friendly, French, AMX-13, Light Tank.
- It's a difficult view, probably one of the hardest you'll get.
- Note especially its low ground clearance and how the turret sets on the chassis. Looks somewhat like a bell.

Trial 17: M109 SP, OR

• Friendly, American, M109 SP.

• You can make out the muzzle brake very clearly in this view. It gives a very heavy look to the gun tube. Tank guns, on the other hand, appear long and slender; no massiveness to them.

Trial 18: Centurion, OR

• Friendly, British, Centurion Tank.

• By this time you should have it identified fairly well. It's the British Centurion.

• It's not a new tank. It's been in service for many, many years. Back in the 1950s it had a stabilization system for firing the main gun.

Trial 19: M60A1, SL

• Friendly, American, M60A1 Tank.

• Recent experimental tests with air cavalry personnel disclosed that our own forces misidentify the M60A1 as a Soviet or French tank fairly often. Take a good look at it.

Trial 20: Gepard, SL

• Friendly, West German, Gepard (Flakpanzer).

• Note the very thick pods for the guns on the turret sides.

• Note also how difficult it is to see the front tracking radar.

Trial 21: M109 SP, OR

• Friendly, American, M109 SP.

• We know it's an SP, but what is the correct identifier? (WAIT FOR CLASS RESPONSE) M-1-0-9.

• You might want to compare the length of the gun with the length of the chassis. The gun appears to come up about even with the front of the vehicle. This feature may help you at sometime in the future in differentiating self-propelled vehicles.

Trial 22: Centurion, SL

- Friendly, British, Centurion Tank.
- Does anyone need help with this vehicle? (IF SO, HELP THEM)

Trial 23: M60A1, SR

- Friendly, American, M60A1 Tank.
- The slide shows clearly the long turret and high side-walls.
- Note the cupola and the very squared look of the back of the turret.

Trial 24: Gepard, F

- Friendly, West German, Gepard (Flakpanzer).
- The tracking radar shows up quite well in this slide.
- Note the very sharp prow line and sharply sloping front.
- The reason the twin guns stand out so clearly is that the light falling from above creates a dark shadow line under the guns.

Trial 25: AMX-13, OL

- Friendly, French, AMX-13, Light Tank.
- Need I say more?

Section B: Automated Training Outline

(15 second duration for each slide)

Trial 26: M60A1, OL

- Friendly, American, M60A1 Tank.
- This vehicle is currently being improved. Will be called the M60A3.
- Note the large turret.

Trial 27: M109, F

- Friendly, American, M109 SP.
- This vehicle is currently being updated with a longer gun tube.

Trial 28: AMX-13, OR

- Friendly, French, AMX-13, Light Tank.
- This tank has been in production for 20 years. They keep putting a bigger gun on it.
- The large turret overhang is one of its most noticeable characteristics.

Trial 29: Centurion, SL

- Friendly, British, Centurion Tank.
- It has been the standard British tank for over 20 years.
- One of the most successful and versatile designs ever developed.

Trial 30: Gepard, SR

- Friendly, West German, Gepard (Flakpanzer).
- Can fire 550 rounds per minute.
- The large weapon pods on the high rectangular turret make it stand out.

Trial 31: AMX-13, SL

- Friendly, French, AMX-13, Light Tank.
- This vehicle has an automatic loader which enables it to maintain a very low profile.

Trial 32: M60A1, OR

- Friendly, American, M60A1 Tank.
- Newer model will have flexible side skirts and a loader's machine-gun on the hatch.
- The turret is its distinctive feature.

Trial 33: Centurion, SR

- Friendly, British, Centurion Tank.
- Full side skirts set off this vehicle.

Trial 34: Gepard, F

- Friendly, West German, Gepard (Flakpanzer).
- It can engage targets in a completely automatic mode.

Trial 35: M109, OL

- Friendly, American, M109 SP.
- The track and suspension system employs 7 roadwheels.
- Heavy turret and uniquely designed gun tube. Looks like a plumber's helper on the end of it.

Trial 36: Centurion, F

- Friendly, British, Centurion Tank.
- The ears on the turret are, in reality, storage boxes.

Trial 37: AMX-13, SR

- Friendly, French, AMX-13, Light Tank.
- Relies almost entirely on its speed, as the armor is very light.

Trial 38: Gepard, OL

- Friendly, West German, Gepard (Flakpanzer).
- One of the best air defense weapon systems in the world.

Trial 39: M109, OR

- Friendly, American, M109 SP.
- Smallest gun in the US Services to fire a nuclear warhead.

Trial 40: M60A1, SL

- Friendly, American, M60A1 Tank.
- Newer model will incorporate a commander's low profile hatch.

Trial 41: Gepard, OR

- Friendly, West German, Gepard (Flakpanzer).
- Note that the weapon pods are at the rear of the turret.

Trial 42: Centurion, OL

- Friendly, British, Centurion Tank.
- This vehicle is still in service by countries all over the world.

Trial 43: M109, SL

- Friendly, American, M109 SP (155mm gun).
- This vehicle will float.
- It's used by a large number of NATO countries, so don't be confused if you see other types of markings on the vehicle.

Trial 44: M60A1, SR

- Friendly, American, M60A1 Tank.
- Note especially the large gap from the top of the roadwheels to the top of the track.

Trial 45: AMX-13, F

- Friendly, French, AMX-13, Light Tank.
- An extremely difficult view.
- It's the lightest tank to mount a 105mm gun.
- The vehicle in this slide has a smaller gun on it.

Trial 46: M109, SR

- Friendly, American, M109 SP (155mm gun).
- Can fire 45 rounds per hour at a sustained fire rate.

Trial 47: Gepard, SL

- Friendly, West German, Gepard (Flakpanzer).
- Its heavy squared shape and twin guns are features to remember.

Trial 48: M60A1, F

- Friendly, American, M60A1 Tank.
- Reminiscent of a Soviet vehicle from the front.
- The newer model will feature a low profile commander's cupola.

Trial 49: AMX-13, OL

- Friendly, French, AMX-13, Light Tank.
- Many French armored vehicles have unique shapes.

Trial 50: Centurion, OR

- Friendly, British, Centurion Tank.
- Keep in mind the turret shape and how it's situated on the chassis.
- Skirts can always be blown off or removed.

MODULE 3: TARGET ARRAY
Chieftain
T54/55
BTR-50
M551
ZSU 23-4

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 3

Section A: Manual Training Sequence

Trial	Vehicle	View
1	Chieftain	SL
2	M551	OR
3	T54/55	SR
4	ZSU 23-4	F
5	BTR-50	OL
6	T54/55	F
7	Chieftain	SR
8	ZSU 23-4	OL
9	BTR-50	OR
10	M551	SL
11	ZSU 23-4	OR
12	T54/55	OL
13	BTR-50	SL
14	M551	SR
15	Chieftain	F
16	BTR-50	SR
17	ZSU 23-4	SL
18	M551	F
19	Chieftain	OL
20	T54/55	OR
21	M551	OL
22	BTR-50	F
23	Chieftain	OR
24	T54/55	SL
25	ZSU 23-4	SR

MODULE 3: TARGET ARRAY
Chieftain
T54/55
BTR-50
M551
ZSU 23-4

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 3

Section B: Automated Training Sequence

Trial	Vehicle	View
26	BTR-50	SR
27	ZSU 23-4	SL
28	M551	F
29	Chieftain	OL
30	T54/55	OR
31	M551	OL
32	BTR-50	F
33	Chieftain	OR
34	T54/55	SL
35	ZSU 23-4	SR
36	Chieftain	SL
37	M551	OR
38	T54/55	SR
39	ZSU 23-4	F
40	BTR-50	OL
41	T54/55	F
42	Chieftain	SR
43	ZSU 23-4	OL
44	BTR-50	OR
45	M551	SL
46	ZSU 23-4	OR
47	T54/55	OL
48	BTR-50	SL
49	M551	SR
50	Chieftain	F

MODULE 3: TARGET ARRAY
Chieftain
T54/55
BTR-50
M551
ZSU 23-4

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 3

Section C: Final Tests (Automated)*

	Trial	Vehicle	View
Test I			
	1	T54/55	F
	2	Chieftain	SR
	3	ZSU 23-4	OL
	4	BTR-50	OR
	5	M551	SL
Test II			
	1	ZSU 23-4	OR
	2	T54/55	OL
	3	BTR-50	SL
	4	M551	SR
	5	Chieftain	F
Test III			
	1	BTR-50	SR
	2	ZSU 23-4	SL
	3	M551	F
	4	Chieftain	OL
	5	T54/55	OR
Test IV			
	1	M551	OL
	2	BTR-50	F
	3	Chieftain	OR
	4	T54/55	SL
	5	ZSU 23-4	SR
Test V			
	1	Chieftain	SL
	2	M551	OR
	3	T54/55	SR
	4	ZSU 23-4	F
	5	BTR-50	OL

*Instructor will use only 1 of 5 possible Final Tests for this Module. Test should be chosen at random.

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 3

Section A: Manual Training Outline

Trial 1: Chieftain, SR

- Friendly, British, Chieftain Tank.
- Four major characteristics stand out in this view:

1. The extreme long, low length of the tank.
2. The large, low, flat turret.
3. The very long thick gun tube; it's a 120mm gun.
4. The standardized shape of British armored skirts covering the suspension system. The skirts cover a large area and come down close to the ground and have the gradual upward slope in the rear.

Trial 2: M551, OR

- Friendly, American, M551, Sheridan Tank (Armored Reconnaissance Airborne Vehicle).
- This vehicle has 3 major characteristics:

1. the clam-shaped turret,
2. short, thick gun tube,
3. high side decking.

- The chassis has a short compact look to it.
- The vehicle can swim.
- Note the short gradual slope on the bow of the vehicle.

Trial 3: T54/55, SR

- Threat, Soviet, T54/55 Tank.

- Soviet tanks are characterized by their:

    1. low compact look,
    2. dome- or cup-shaped turret,
    3. long slender gun tube.

- Pay particular attention to the turret shape; it's one way of telling the difference between this tank and other Soviet tanks. The modern Soviet tanks, since 1945, all tend to look much alike.

- Another cue which you can use to identify this tank is the wide gap between the roadwheels in the front.

- Note the suspension, often called "Christie." This type of suspension is characteristic of Soviet vehicles.

Trial 4: ZSU 23-4, F

- Threat, Soviet, ZSU 23-4, Air Defense Weapon.

- Note the very flat vertical (rather than sloped) angles on the front of the vehicle and front of the turret.

- The radar dish also will help you.

- Its overall appearance is very squared, or boxy, looking.

- It has 4 barrels clustered in the center of the turret. The guns are water-cooled.

Trial 5: BTR-50, OL

- Threat, Soviet, BTR-50, Armored Personnel Carrier.

- The front part of the vehicle looks like a wedge.

- The back part of the deck is very flat.

- Note the infantry in the carrier and the machinegun at the right.

- Look at the low, long track; there appears to be a lot of roadwheels, as compared to other vehicles you have seen.

- This vehicle forms one of a complete family of light armored vehicles.

Trial 6: T54/55, F

- Threat, Soviet, T54/55 Tank.
- The low silhouette and round-shaped turret identify it as a possible Soviet tank.
- From this view it's often confused with a French tank, the AMX-30.
- This is the most difficult view. Take a good look.

Trial 7: Chieftain, SR

- Friendly, British, Chieftain Tank.
- The skirts and unusual turret configuration make this vehicle stand out; particularly in the side view.
- Note its long length and low skirting.
- The thing that should stand out in your mind is the apparent large size of the vehicle as compared to other vehicles.

Trial 8: ZSU 23-4, OL

- Threat, Soviet, ZSU 23-4, Air Defense Weapon.
- The 4 gun barrels stand out very clearly in this slide.
- It can fire at both air and ground targets.
- Other features to remember are:

    1. The very long turret; it has full traverse.
    2. The high, flat sides and front, much like an SP weapon.
    3. The low suspension consisting of 6 roadwheels.

- The turret is exceptionally large, which makes this vehicle easy to identify.

Trial 9: BTR-50, OR

- Threat, Soviet, BTR-50, Armored Personnel Carrier.
- The wedge-shaped front and flat rear deck make this vehicle stand out.
- The crew and personnel compartment located toward the front make it distinctive.
- Employed in reconnaissance units in support of the PT-76 light tank.
- It's amphibious and is a very roomy vehicle.

Trial 10: M551, SL

- Friendly, American, M551, Sheridan Tank.
- The short chassis and high, squared deck lines which seem to be characteristic of amphibious vehicles.
- Again, we have the very low clam-shaped turret and short gun.
- The dark square at the front of the turret is the searchlight.

Trial 11: ZSU 23-4, OR

- Threat, Soviet, ZSU 23-4, Air Defense Weapon.
- The sharply sloped, chopped front and straight up and down side lines are features which stand out.
- The guns and radar dish aid further in identifying this vehicle.
- Its radar can pick up a target at 20 kilometers.

Trial 12: T54/55, OL

- Threat, Soviet, T54/55 Tank.
- The sleek, low, compact silhouette identifies this as the T54/55.
- We can see clearly the front gap in the roadwheels.
- Note that the turret is centered in relationship to the hull.

Trial 13: BTR-50, SL

- Threat, Soviet, BTR-50, Armored Personnel Carrier.
- In this slide you can see the sharp delineation between the deck and crew compartment.
- Note the machinegun at the front of the personnel compartment.

Trial 14: M551, SR

- Friendly, American, M551, Sheridan Tank.
- Short gun, high sides, and low oval turret add up to the M551 Sheridan.
- Note that the deck line at the front is scooped slightly.

Trial 15: Chieftain, F

- Friendly, British, Chieftain Tank.
- A very difficult view.
- The low, oval turret and low hull appearance from the front are features to look for.
- The low and overall large appearance as compared to other vehicles from the front view may also aid you.

Trial 16: BTR-50, SR

- Threat, Soviet, BTR-50, Armored Personnel Carrier.
- The forward crew compartment and flat deck should help you in identifying this vehicle. It's the BTR-50.

Trial 17: ZSU 23-4, SL

- Threat, Soviet, ZSU 23-4, Air Defense Weapon.
- A unique and unusually designed vehicle is the ZSU 23-4.
- In the Arab-Israeli conflict in 1973, it proved to be one of the most effective of all the low-level air defense systems.

Trial 18: M551, F

- Friendly, American, M551, Sheridan Tank.

- The narrow, fairly high rectangular shape and the low clamshell turret help in identifying this vehicle.

- Note the exceptionally wide turret; the sides are about the same size in width as the hull.

Trial 19: Chieftain, OL

- Friendly, British, Chieftain Tank.

- The thing that stands out in my mind is the large size of the vehicle as compared with other vehicles.

- This tank appeared in the early 1960s.

- Iran has ordered approximately 1,950 of these tanks.

Trial 20: T54/55, OR

- Threat, Soviet, T54/55 Tank.

- I want you to look carefully at this vehicle, as all other Soviet vehicles are modeled after it. It's the T54/55. The T54 and T55 are two different models that look so much alike that it's almost impossible to tell them apart. Either designation is acceptable. Don't fail to recognize it as a "threat."

Trial 21: M551, OL

- Friendly, American, M551, Sheridan Tank.

- This vehicle was originally designed to be used in airborne and reconnaissance units.

- Its gun will fire the "Shillelagh" missile or a 152mm projectile. It packs a hell of a punch on a light chassis. It's currently being phased out. Was used in Vietnam.

Trial 22: BTR-50, F

• Threat, Soviet, BTR-50, Air Defense Weapon.

• Looks a lot like the BTR-60. The most notable difference is that it has a very, flat straight armored front, giving it the appearance of a more square wedge-shape from the front.

• The BTR-50 series of vehicles are track vehicles. The BTR-60 is wheeled.

Trial 23: Chieftain, OR

• Friendly, British, Chieftain Tank.

• The many angled low, flat turret is different than any other tank.

• The thickness of the gun tube is due to a thermal wrapping which helps to avoid gun tube droop during firing or hot weather.

• The latest model of this tank, built for the Iranians, is considered one of the best tanks in the world.

Trial 24: T54/55, SL

• Threat, Soviet, T54/55 Tank.

• Centered, rounded turret and low silhouette, plus suspension, lets us know it's Soviet.

• If you could see the bore evacuator, it may help you in identifying this model tank. The evacuator is on the end of the gun tube, not set back as in most current tanks.

Trial 25: ZSU 23-4, SR

• Threat, Soviet, ZSU 23-4, Air Defense Weapon.

• If you are having trouble with the name, it's the ZSU 23-4.

• The guns can be laid and fired on the move.

Section B: Automated Training Outline

(15 second duration for each slide)

Trial 26: BTR-50, SR

- Threat, Soviet, BTR-50, Armored Personnel Carrier.
- The forward crew compartment and flat deck should help you in identifying this vehicle.
- This vehicle has an open top; later models have large roof doors.

Trial 27: ZSU 23-4, SL

- Threat, Soviet, ZSU 23-4, Air Defense Weapon.
- Each tank regiment has 8 of these.
- Its shape is unique.
- Its large, square appearance makes it easy to identify.

Trial 28: M551, F

- Friendly, American, M551, Sheridan Tank.
- It's noted for its excellent cross-country mobility.

Trial 29: Chieftain, OL

- Friendly, British, Chieftain Tank.
- Can fire high-explosive ammunition out to 8000 meters. That's a lot of meters.

Trial 30: T54/55, OR

- Threat, Soviet, T54/55 Tank.
- This vehicle weighs only 35.9 tons, as compared to 50 tons for the M60A1 and Chieftain.

Trial 31: M551, OL

- Friendly, American, M551, Sheridan Tank.
- It can swim by use of a flotation screen, which is erected by the crew.
- Operation of the vehicle requires a high degree of training.

Trial 32: BTR-50, F

- Threat, Soviet, BTR-50, Armored Personnel Carrier.
- In all versions of this vehicle, the crew mounts and dismounts through the roof openings.

Trial 33: Chieftain, OR

- Friendly, British, Chieftain Tank.
- The gun is stabilized in azimuth and elevation to permit firing on the move.
- Note the many angled turret design.

Trial 34: T54/55, SL

- Threat, Soviet, T54/55 Tank.
- It's very cramped inside. The T54 has a 12.7 AA weapon, the T55 does not.

Trial 35: ZSU 23-4, SR

- Threat, Soviet, ZSU 23-4, Air Defense Weapon.
- Fires both high-explosive and armor-piercing projectiles.
- Normal rate of fire is about 200 rounds per minute; that's per gun.

Trial 36: Chieftain, SL

- Friendly, British, Chieftain Tank.
- Its gun is exceptionally accurate and hard hitting.
- Note how long it looks from the side.

Trial 37: M551, OR

- Friendly, American, M551, Sheridan Tank.
- This vehicle has 3 major characteristics:

1. the clam-shaped turret,
2. short, thick gun tube,
3. high side decking.

Trial 38: T54/55, SR

- Threat, Soviet, T54/55 Tank.
- Centered, rounded turret and low silhouette, plus suspension, lets you know it's Soviet.

Trial 39: ZSU 23-4, F

- Threat, Soviet, ZSU 23-4, Air Defense Weapon.
- Its overall appearance is very squared, or boxy.
- Effective antiaircraft range is 2000-2500 meters.

Trial 40: BTR-50, OL

- Threat, Soviet, BTR-50, Armored Personnel Carrier.
- Carries a crew of 3, plus 12 infantrymen.
- The front part of the vehicle looks like a wedge.
- The back part of the deck is very flat.

Trial 41: T54/55, F

- Threat, Soviet, T54/55 Tank.
- This is its most difficult view.
- It's used by 25 other countries besides the Warsaw Pact armies.

Trial 42: Chieftain, SR

- Friendly, British, Chieftain Tank.
- The gun can hit armored targets out to 3000 meters with great accuracy.

Trial 43: ZSU 23-4, OL

- Threat, Soviet, ZSU 23-4, Air Defense Weapon.
- Its effective ground range is 2000 meters.
- Carries a crew of 4.
- Note its high, flat sides and front, much like a self-propelled weapon.

Trial 44: BTR-50, OR

- Threat, Soviet, BTR-50, Armored Personnel Carrier.
- The Czechoslovakian version of this has twin cupolas at the front.
- Remember, the BTR-50 family of vehicles are tracked-vehicles.

Trial 45: M551, SL

- Friendly, American, M551, Sheridan Tank.
- Short gun, high sides, and low oval turret add up to the M551 Sheridan.

Trial 46: ZSU 23-4, OR

- Threat, Soviet, ZSU 23-4, Air Defense Weapon.
- The sharply sloped chopped front and straight up and down side lines are features which stand out.

Trial 47: T54/55, OL

- Threat, Soviet, T54/55 Tank.
- Small, well-rounded turret.
- Note large front gap between first 2 roadwheels.

Trial 48: BTR-50, SR

- Threat, Soviet, BTR-50, Armored Personnel Carrier.
- In this slide we can see the sharp delineation between the deck and crew compartment.

Trial 49: M551, SR

- Friendly, American, M551, Sheridan Tank.
- The first vehicle to use a dual gun tube to fire missiles and conventional ammunition.
- The first American vehicle to use a combustible cartridge case.

Trial 50: Chieftain, F

- Friendly, British, Chieftain Tank.
- Considered to be one of the best tanks in the world.
- Look carefully at the turret lines.

MODULE 4: TARGET ARRAY
AMX-30
Marder
T-72
PT-76
Scimitar

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 4

Section A: Manual Training Sequence

Trial	Vehicle	View
1	AMX-30	F
2	PT-76	OL
3	Scimitar	OR
4	Marder	SL
5	T-72	SR
6	PT-76	OR
7	Scimitar	SL
8	Marder	SR
9	T-72	F
10	AMX-30	OL
11	Scimitar	SR
12	Marder	F
13	T-72	OL
14	AMX-30	OR
15	PT-76	SL
16	Marder	OL
17	T-72	OR
18	AMX-30	SL
19	PT-76	SR
20	Scimitar	F
21	T-72	SL
22	AMX-30	SR
23	PT-76	F
24	Scimitar	OL
25	Marder	OR

MODULE 4: TARGET ARRAY
AMX-30
Marder
T-72
PT-76
Scimitar

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 4

Section B: Automated Training Sequence

Trial	Vehicle	View
26	Marder	OL
27	Scimitar	OR
28	PT-76	F
29	AMX-30	SL
30	T-72	SR
31	Scimitar	F
32	PT-76	SL
33	AMX-30	SR
34	T-72	OL
35	Marder	OR
36	PT-76	SR
37	AMX-30	OL
38	T-72	OR
39	Marder	F
40	Scimitar	SL
41	AMX-30	OR
42	T-72	F
43	Marder	SL
44	Scimitar	SR
45	PT-76	OL
46	T-72	SL
47	Marder	SR
48	Scimitar	OL
49	PT-76	OR
50	AMX-30	F

MODULE 4: TARGET ARRAY
AMX-30
Marder
T-72
PT-76
Scimitar

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 4

Section C: Final Tests (Automated)*

	Trial	Vehicle	View
Test I			
	1	PT-76	OR
	2	Scimitar	SL
	3	Marder	SR
	4	T-72	F
	5	AMX-30	OL
Test II			
	1	Scimitar	SR
	2	Marder	F
	3	T-72	OL
	4	AMX-30	OR
	5	PT-76	SL
Test III			
	1	Marder	OL
	2	T-72	OR
	3	AMX-30	SL
	4	PT-76	SR
	5	Scimitar	F
Test IV			
	1	T-72	SL
	2	AMX-30	SR
	3	PT-76	F
	4	Scimitar	OL
	5	Marder	OR
Test V			
	1	AMX-30	F
	2	PT-76	OL
	3	Scimitar	OR
	4	Marder	SL
	5	T-72	SR

*Instructor will use only 1 of 5 possible Final Tests for this Module. Test should be chosen at random.

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STUDIES IN LONG RANGE TARGET IDENTIFICATION.(U)
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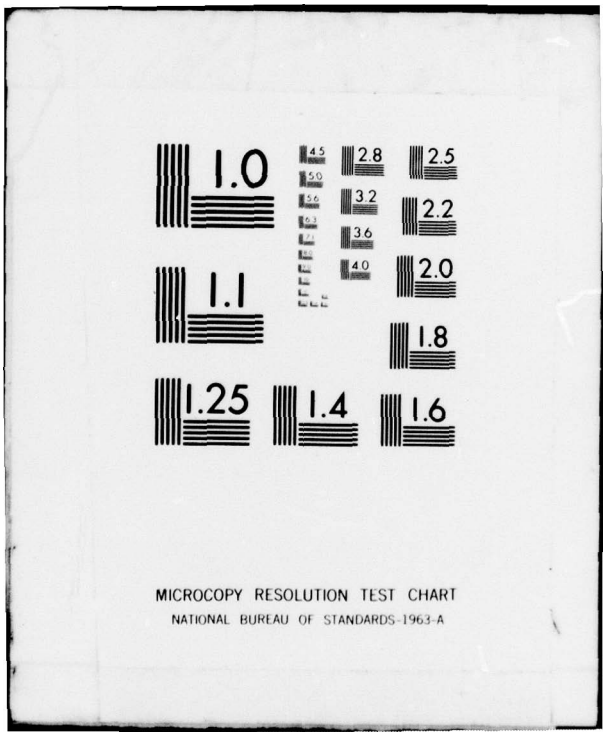
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6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 4

Section A: Manual Training Outline

Trial 1: AMX-30, F

- Friendly, French, AMX-30, Light Tank.
- This tank is misidentified as a threat vehicle more than any other friendly vehicle. Take a careful look, as this is the most difficult of all vehicles to recognize or identify.
- It has 2 major features that may help you:

1. The very low, oval-shaped turret; the turret lines are smooth and unbroken.

2. The fairly large, flat frontal area leading up to the turret.

- There is a commander's cupola, but it's difficult to see.

Trial 2: PT-76, SL

- Threat, Soviet, PT-76, Amphibious Tank.
- The small turret perched well forward and the flat rear deck helps in identifying this vehicle.
- The typical Soviet-type suspension system with what looks like a lot of roadwheels (very large wheels) are other features.
- The high sponson line which is typical of vehicles which swim should also help you.
- This tank was designed specifically as an amphibious vehicle.

Trial 3: Scimitar, OR

- Friendly, British, Scimitar, Scout Vehicle.

- This vehicle looks so much like a Scorpion that at a distance it's almost impossible to tell them apart. They share the same chassis and differ in minor turret features and size of main gun.

- It's a low vehicle, with the turret placed on the rear of the vehicle.

- Note how difficult it is to see the gun.

Trial 4: Marder, SL

- Friendly, West German, Marder, Armored Personnel Carrier.

- Distinctive features are:

1. heavy, thick raised gun turret centered on the chassis,
2. sharply sloped armor,
3. scalloped skirts.

Trial 5: T-72, SR

- Threat, Soviet, T-72 Tank.

- This is the latest Soviet main battle tank.

- Distinctive features are:

1. Low silhouette. The suspension uses support rollers; which is a departure for Soviet tanks.

2. Teacup-shaped turret with an extremely long main gun.

3. Turret is centered on the chassis.

4. Also, note the gradual downward sloping to the front which gives the track a tapered appearance towards the front of the vehicle.

Trial 6: PT-76, OR

- Threat, Soviet, PT-76, Light Tank.
- Its very unusual appearance should make this vehicle easy to identify.
- The water-jet propulsion gives it the ability to operate in a fast moving river or the open sea. It can attain speeds of 11 mph in the water.
- The hull design is much like that of a boat with the high frontal prow.

Trial 7: Scimitar, SL

- Friendly, British, Scimitar, Recon Vehicle.
- Note the kind of half skirt on the front fender.
- Also, note the very long, slender gun tube. The tube projects a short way past the front of the vehicle.
- Small silhouette size with the turret at the rear, making the vehicle appear squared at the back.
- Notice also the long gradual slope from just in front of the turret to the front of the vehicle.

Trial 8: Marder, SR

- Friendly, West German, Marder, Armored Personnel Carrier.
- There is a machinegun cupola at the rear of this vehicle; it's hard to see, but can help you, depending on the range to the vehicle.
- You can see the main weapon very clearly in this slide.
- The vehicle appears to be very compact and thick. This is characteristic of APCs.
- Note how the vehicle outline slopes downward, starting at about the vehicle's midpoint with a fairly flat rear deck.
- Again, we have the scalloped skirts characteristic of West German vehicles.

Trial 9: T-72, F

- Threat, Soviet, T-72 Tank.
- The turret is not quite as low as the AMX-30.
- Note how the fenders stand out in relief.
- The turret is evenly rounded and sets in a little on both sides from the edge of the tank.
- The main gun is a 125mm gun, the biggest of all main battle tanks.

Trial 10: AMX-30, OL

- Friendly, French, AMX-30, Light Tank.
- Again, note the very flat, low turret.
- This particular slide does show the searchlight, but, again, don't rely on it as your only cue.
- The front slope has a fairly sharp angle; note the absence of definitive fender lines. The fenders seem to blend in with the front armor rather than stand out in relief, as in the T-72 tank.
- One thing which does differentiate this vehicle from the Soviet is its much higher silhouette and the non-Soviet type suspension system.

Trial 11: Scimitar, SR

- Friendly, British, Scimitar, Recon Vehicle.
- Only has 4 roadwheels due to its short length.
- Note the half skirts on the front.
- Large turret sets well on the rear of the vehicle.
- Try to get a look at the long, slender gun tube; this helps in identifying it as a Scimitar, not the Scorpion, which has a heavier, shorter 76mm gun.
- The gun on the Scimitar is a 30mm cannon (Rarden gun).

Trial 12: Marder, F

• Friendly, West German, Marder, Armored Personnel Carrier.

• Most noticeable features are the high front slope and high silhouette.

• This slide also shows the gun clearly. At ranges of 3500 to 4000 meters, this gun will disappear from your sight. Use it as a reinforcer clue at extreme distances and a major clue at closer distances. The trick is to know at what distance the various characteristics and cues appear or wash out. That comes with practice and a knowledge of your own personal visual capabilities.

• Note the high ground clearance in front.

Trial 13: T-72, OL

• Threat, Soviet, T-72 Tank.

• In this slide you can see the high, thick sponsons tapering toward the front of the tank. Also, notice the high front fender line at the front of the prow.

• The low silhouette and rounded turret of the vehicle definitely stamps this vehicle as Soviet.

• Note how the turret is well back toward the center of the tank.

Trial 14: AMX-30, OR

• Friendly, French, AMX-30, Light Tank.

• The AMX-30 in this slide shows very clearly the external muffler located conspicuously at the rear of the vehicle. There's another one on the other side in the same location. Use these to help you, but don't rely on using them at longer ranges. They wash out.

• We have the low, beetle-like turret.

• Notice how the armor slopes all around the turret.

• It is the lightest (36 tons) main battle tank mounting a 105mm gun.

Trial 15: PT-76, SL

- Threat, Soviet, PT-76, Light Tank.
- Usually found in reconnaissance units.
- It can fire while floating on the water.
- It's an ideal recon vehicle, but has limitations as a fighting vehicle.
- High, squared sidelines help in identifying it as an amphibious vehicle.
- This slide gives you a very clear look at the unusual bell-shaped turret (located far forward) and flat rear deck.

Trial 16: Marder, OL

- Friendly, West German, Marder, Armored Personnel Carrier.
- The vehicle appears to be heavy and fairly massive.
- The weapon on top can be clearly seen in this slide.
- The scalloped skirts and sloping armor are two other characteristics.

Trial 17: T-72, OR

- Threat, Soviet, T-72 Tank.
- In this slide you should see all the features which are characteristic of Soviet tanks.
- The length of the gun tube appears to be extremely long; looks about as long as the chassis.
- The turret is what I call high-domed rather than slope-domed.
- Fuel cells cover almost the whole length of the right-hand fender and rear half of the left fender.
- Note the deck line. At the rear it looks like an amphibious design and then tapers toward the front. Keep in mind how the front of the track and suspension appear to be tapered.

Trial 18: AMX-30, SL

• Friendly, French, AMX-30, Light Tank.

• This slide shows the difference between what I call "high-domed" and "low-domed" turret sides. Look at this distinctive low oval turret. Let's go back and look at the T-72 turret. (FLASH BACK TO TRIAL 17.) Now, let's take a look again at the AMX-30; note that it has a low-domed appearance.

• The muffler on the rear of the vehicle can aid in identification.

• Note how the turret armor slopes and meets the deck lines, giving it a very sloped look.

• The gun tube has no bore evacuator or muzzle brake, and the gun tube is very thick.

Trial 19: PT-76, SR

• Threat, Soviet, PT-76, Light Tank.

• I don't think we need to go into much detail with this one.

• It's the PT-76 amphibious light tank. The Soviets also have a newer amphibious tank; the BMD, known as the M1970 Light Tank.

Trial 20: Scimitar, F

• Friendly, British, Scimitar. Recon Vehicle.

• This is a tough view, but the vehicle is fairly distinctive, even from the front.

• The wide flat expanse leading up to the turret.

• Note how the turret appears to have beveled edges like a cut jewel.

• The very small vehicle size and low ground clearance should also help you.

Trial 21: T-72, SL

• Threat, Soviet, T-72 Tank.

• The fording snorkel can be seen on the side of the turret. Don't rely on this cue as almost all fording equipment is portable and not built into the vehicle. In some pictures it has been seen carried on the back deck.

• The deck and track line makes this vehicle stand out from other Soviet tanks. The track uses support rollers like our tanks.

• Note that the turret is slightly tapered toward the front.

Trial 22: AMX-30, SR

• Friendly, French, AMX-30, Light Tank.

• By this time you should be able to identify this tank without too much trouble. Its beetle shape makes it look like Soviet vehicles, but it appears much bigger than the Soviet tanks.

• The AMX-30 was designed primarily to fight other tanks.

Trial 23: PT-76, F

• Threat, Soviet, PT-76, Light Tank.

• From the front this vehicle can look like a lot of different vehicles. What stands out is the very small sharply sloped turret and the overall small size of the vehicle.

• Note the high prow line and the deep shadow, indicating a sharp upward angle.

Trial 24: Scimitar, OL

• Friendly, British, Scimitar, Scout Vehicle.

• The thin gun barrel can be seen in this slide.

• The small flat turret offset to the rear.

Trial 25: Marder, OR

- Friendly, West German, Marder, Armored Personnel Carrier.

- It's a unique looking vehicle and very sleek for an armored personnel carrier. Considered one of the best in the world.

- Its main weapon stands out in this slide. The weapon is a 20mm mounted in a 2-man turret. The turret also contains a 7.62mm machine-gun.

Section B: Automated Training Outline

(15 second duration for each slide)

Trial 26: Marder, OL

- Friendly, West German, Marder, Armored Personnel Carrier.
- Surprisingly, it does not swim, but it can deep-ford.
- The 20mm cannon can be fired by either the commander or the gunner.

Trial 27: Scimitar, OR

- Friendly, British, Scimitar, Scout Vehicle.
- Particular attention has been taken to reduce external noises for reconnaissance purposes.
- It's a low vehicle with the turret placed on the rear of the vehicle.

Trial 28: PT-76, F

- Threat, Soviet, PT-76, Light Tank.
- What stands out is the very small, sharply sloped turret and the overall apparent small size of the vehicle.
- There have been four production models of this vehicle; the only difference being the main armament.

Trial 29: AMX-30, SL

- Friendly, French, AMX-30, Light Tank.
- Note how the turret armor slopes and meets the deck lines, giving it a very sloped look.
- Its oblique angles provide it good ballistic protection.
- Its gun is effective out to 3000 meters, using an antitank round.

Trial 30: T-72, SR

- Threat, Soviet, T-72 Tank.
- It has a 3-man crew and an auto-loader.
- It employs light armor plate skirts on the front half of each side. They stick out at a 60° angle when not tied back.
- Remember where the turret is placed and the long gun tube.

Trial 31: Scimitar, F

- Friendly, British, Scimitar, Recon Vehicle.
- Note the wide, flat expanse at the front of the vehicle. This is created by mounting the engine in the front.

Trial 32: PT-76, SL

- Threat, Soviet, PT-76, Light Tank.
- The small turret perched well forward and the flat rear deck are outstanding features.
- The commander acts as gunner and radio operator. This reduces the commander's effectiveness as an observer.

Trial 33: AMX-30, SR

- Friendly, French, AMX-30, Light Tank.
- Later production models will mount a 20mm coaxial weapon.
- I think of a beetle when I see this tank.

Trial 34: T-72, OL

- Threat, Soviet, T-72 Tank.
- The T-72 mounts a toothed-shovel/dozer blade in front. This enables it to dig itself in, in a few minutes.
- It also mounts two large, square bustle boxes on each side at the rear of the turret. This slide does not show them. They make the vehicle much easier to identify.

Trial 35: Marder, OR

- Friendly, West German, Marder, Armored Personnel Carrier.
- There is a cupola at the rear, mounting a 7.62mm machinegun for rear defense. Only vehicle that incorporates a rear defense weapon.
- The seats fold into beds and they string up hammocks.

Trial 36: PT-76, SR

- Threat, Soviet, PT-76, Light Tank.
- This tank has no NBC protection and almost no night vision equipment.
- Its design permits it to get into and out of water easily. The chassis looks like a boat.

Trial 37: AMX-30, OL

- Friendly, French, AMX-30, Light Tank.
- One thing which does differentiate this vehicle from Soviet vehicles is its much higher silhouette and the non-Soviet type suspension system.

Trial 38: T-72, OR

- Threat, Soviet, T-72 Tank.
- The diesel engine is smooth running and free of the smoke signature you usually get with a diesel.
- The commander and gunner hatches are forward hinged, so they offer ballistic protection in the open position.

Trial 39: Marder, F

- Friendly, West German, Marder, Armored Personnel Carrier.
- This vehicle holds 11 crew members; 7 infantrymen, 2 gunners, commander, and driver.
- The cupola is a major feature, but tends to fade out at distances of 3000 meters and over.
- Most noticeable features are the high front slope and high silhouette.

Trial 40: Scimitar, SL

- Friendly, British, Scimitar, Recon Vehicle.
- Note the very long slender gun tube. The tube projects a short way past the front of the vehicle.
- The vehicle was designed for simplicity of crew duties and ease of maintenance.

Trial 41: AMX-30, OR

- Friendly, French, AMX-30, Light Tank.
- We have the low, beetle-like turret. Notice how the armor slopes all around the turret.
- Carries a crew of 4.

Trial 42: T-72, F

- Threat, Soviet, T-72 Tank.
- The turret is equally rounded and sets in a little on both sides from the edge of the tank.
- Two large spare fuel drums can be carried across the back of the tank. This is also characteristic of Soviet vehicles.

Trial 43: Marder, SL

- Friendly, West German, Marder, Armored Personnel Carrier.
- The vehicle has firing ports along the sides and top.
- Special attention has been given to crew comfort during closed-hatch operations.

Trial 44: Scimitar, SR

- Friendly, British, Scimitar, Recon Vehicle.
- Try to get a look at the long slender gun tube; this helps in identifying it as a Scimitar, not the Scorpion, which has a heavier, shorter 76mm gun.

Trial 45: PT-76, OL

- Threat, Soviet, PT-76, Light Tank.
- This vehicle is used by Finland, China, Cuba, North Korea, India, and a host of other countries in and out of the Warsaw Pact nations.
- The very sharply angled front of the vehicle makes it look like a boat.

Trial 46: T-72, SL

- Threat, Soviet, T-72 Tank.
- Note that the turret is slightly tapered toward the front.
- It is believed that this vehicle employs the first Soviet stereoscopic rangefinder.

Trial 47: Marder, SR

- Friendly, West German, Marder, Armored Personnel Carrier.
- The vehicle appears to be very compact and thick. This is characteristic of APCs.
- It's one of the most expensive APCs in the world.

Trial 48: Scimitar, OL

- Friendly, British, Scimitar, Scout Vehicle.
- The thin gun barrel can be seen in this slide.
- This vehicle has excellent mobility. It mounts a Jaguar 6-cylinder engine.
- The commander has excellent surveillance optics.

Trial 49: PT-76, OR

- Threat, Soviet, PT-76, Light Tank.
- The latest model gun features stabilization.
- First seen in 1950.

Trial 50: AMX-30, F

- Friendly, French, AMX-30, Light Tank.
- It has 2 major features that may help you:

1. The very low, oval-shaped turret; the turret lines are smooth and unbroken.

2. The fairly large, flat frontal area leading up to the turret.

MODULE 5: TARGET ARRAY
ZSU 57-2
T54/55
Jagdpanzer
Chieftain
Roland

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 5

Section A: Manual Training Sequence

Trial	Vehicle	View
1	Chieftain	OR
2	ZSU 57-2	F
3	Jagdpanzer	SL
4	T54/55	SR
5	Roland	OL
6	ZSU 57-2	SL
7	Jagdpanzer	SR
8	T54/55	OL
9	Roland	OR
10	Chieftain	F
11	Jagdpanzer	OL
12	T54/55	OR
13	Roland	F
14	Chieftain	SL
15	ZSU 57-2	SR
16	T54/55	F
17	Roland	SL
18	Chieftain	SR
19	ZSU 57-2	OL
20	Jagdpanzer	OR
21	Roland	SR
22	Chieftain	OL
23	ZSU 57-2	OR
24	Jagdpanzer	F
25	T54/55	SL

MODULE 5: TARGET ARRAY
ZSU 57-2
T54/55
Jagdpanzer
Chieftain
Roland

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Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 5

Section B: Automated Training Sequence

Trial	Vehicle	View
26	Jagdpanzer	OL
27	ZSU 57-2	OR
28	Chieftain	SL
29	Roland	SR
30	T54/55	F
31	ZSU 57-2	SL
32	Chieftain	SR
33	Roland	F
34	T54/55	OL
35	Jagdpanzer	OR
36	Chieftain	F
37	Roland	OL
38	T54/55	OR
39	Jagdpanzer	SL
40	ZSU 57-2	SR
41	Roland	OR
42	T54/55	SL
43	Jagdpanzer	SR
44	ZSU 57-2	F
45	Chieftain	OL
46	T54/55	SR
47	Jagdpanzer	F
48	ZSU 57-2	OL
49	Chieftain	OR
50	Roland	SL

MODULE 5: TARGET ARRAY
ZSU 57-2
T54/55
Jagdpanzer
Chieftain
Roland

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 5

Section C: Final Tests (Automated)*

	Trial	Vehicle	View
Test I			
	1	Roland	SR
	2	Chieftain	OL
	3	ZSU 57-2	OR
	4	Jagdpanzer	F
	5	T54/55	SL
Test II			
	1	Chieftain	OR
	2	ZSU 57-2	F
	3	Jagdpanzer	SL
	4	T54/55	SR
	5	Roland	OL
Test III			
	1	ZSU 57-2	SL
	2	Jagdpanzer	SR
	3	T54/55	OL
	4	Roland	OR
	5	Chieftain	F
Test IV			
	1	Jagdpanzer	OL
	2	T54/55	OR
	3	Roland	F
	4	Chieftain	SL
	5	ZSU 57-2	SR
Test V			
	1	T54/55	F
	2	Roland	SL
	3	Chieftain	SR
	4	ZSU 57-2	OL
	5	Jagdpanzer	OR

*Instructor will choose 1 of 5 possible Final Tests for this Module. Test should be chosen at random.

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 5

Section A: Manual Training Outline

Trial 1: Chieftain, OR

- Friendly, British, Chieftain Tank.
- The many angled, low, flat turret is different from any other tank.
- The thickness of the gun tube is due to a thermal wrapping which helps to avoid gun tube droop during firing or hot weather.
- The latest model of this tank, built for the Iranians, is considered one of the best tanks in the world.

Trial 2: ZSU 57-2, F

- Threat, Soviet, ZSU 57-2, Air Defense Weapon.
- Look how low the chassis is to the ground and how the turret sets like a large bowl on top.
- This vehicle has no radar dishes.
- It is used in greater numbers than any other self-propelled anti-aircraft system.

Trial 3: Jagdpanzer, SL

- Friendly, West German, Kanone Jagdpanzer (JPZ 4-5).

- This vehicle is a self-propelled antitank gun, often called an "assault gun."

- Its primary role is to hunt down other tanks.

- It's a very low vehicle; notice the extremely heavy gun mantle.

- One very noticeable feature for identifying this type of vehicle is that the main gun sticks out from the very front of the vehicle.

- Note that it also has 5 roadwheels and no scalloped skirts. Scalloped skirts are usually associated with West German vehicles.

Trial 4: T54/55, SR

- Threat, Soviet, T54/55 Tank.

- Soviet tanks are characterized by their:

    1. low compact look;
    2. dome- or cup-shaped turret;
    3. long, slender gun tube.

- Pay particular attention to the turret slope; it's one way of telling the difference between this tank and other Soviet tanks. Modern Soviet tanks, since 1945, all tend to look much alike.

- Another cue which you can use to identify this tank is the wide gap between the roadwheels in the front.

- Note the suspension, often called "Christie." This type of suspension is characteristic of Soviet vehicles.

Trial 5: Roland, OL

• Friendly, West German, Roland, Air Defense Weapon.

• The chassis is the same as that of the West German APC, the Marder.

• The radar dishes and launchers give this vehicle a very distinctive outline.

• The Roland is a surface-to-air missile for the defense of armored columns and similar mobile fighting units against low-level air attack.

• It has 2 launcher tubes.

Trial 6: ZSU 57-2, SL

• Threat, Soviet, ZSU 57-2, Air Defense Weapon.

• This vehicle has 4 major characteristics which help to identify it:

1. a flat deckline;
2. a high, rectangular-squared turret;
3. twin 57mm, long, slender gun tubes;
4. 4 large, widely-spaced roadwheels.

• The protrusion on the rear of the turret is a wire cage to catch spent cartridge cases when the weapon is firing.

Trial 7: Jagdpanzer, SR

• Friendly, West German, Jagdpanzer (JPZ 4-5) Self-Propelled Antitank Gun.

• In this view you can see the top outline. Notice the slightly raised portion of the crew compartment and very flat rear deck.

• The Germans made extensive use of self-propelled antitank guns during WWII, and the JPZ 4-5 is a continuation of this line of vehicle.

• Be careful in identifying this vehicle, as it can easily be confused with the Soviet ASU-85 SP antitank vehicle.

• Note in particular that the track uses support rollers. This is a major difference between this vehicle and the Soviet ASU-85. The ASU has no support rollers.

Trial 8: T54/55, OL

- Threat, Soviet, T54/55 Tank.
- The sleek, low, compact silhouette identifies this as the T54/55.
- We can see clearly the front gap in the roadwheels.
- Note that the turret is centered in relationship to the hull.

Trial 9: Roland, OR

- Friendly, West German, Roland, Air Defense Weapon.
- Notice that the launchers are located at the rear of the vehicle, leaving a very long front deckline.
- The launchers are automatically loaded from magazines within the vehicle.
- The missiles can be fired on the move.
- The chassis has sloped armor all around the sides and a long, gradual front slope.
- The dark portion at the rear may look like grills, but are, in reality, smoke grenade launchers.

Trial 10: Chieftain, F

- Friendly, British, Chieftain Tank.
- A very difficult view.
- The low, oval turret and low hull appearance from the front are features to look for.
- The low and overall large appearance as compared to other vehicles from the front view may also aid you.

Trial 11: Jagdpanzer, OL

• Friendly, West German, Jagdpanzer (JPZ 4-5).

• The most immediate feature which comes to mind upon seeing this vehicle is its very low, squat shape.

• The thick bore evacuator and bell-shaped muzzle brake set right on the end of the gun tube. They are difficult to see at long ranges.

Trial 12: T54/55, OR

• Threat, Soviet, T54/55 Tank.

• I want you to look carefully at this vehicle, as all other Soviet vehicles are modeled after it. It's the T54/55. The T54 and T55 are two different models that look so much alike that it's almost impossible to tell them apart. Either designation is acceptable. Don't fail to recognize it as a "threat."

Trial 13: Roland, F

• Friendly, West German, Roland, Air Defense Weapon.

• From the front, the tubes and radar dish make this vehicle stand out.

• The high front prow line and long, smooth front slope are other features to remember.

• The French have their Roland mounted on an AMX-30R chassis.

• A third version will probably be developed for the US. The carrier will be the M109R, which is the chassis from a self-propelled artillery weapon.

• Hughes Aircraft and Boeing Aerospace have been licensed to produce the Roland for the US.

Trial 14: Chieftain, SL

- Friendly, British, Chieftain Tank.
- Four major characteristics stand out in this view:

1. The extreme long, low length of the tank.
2. The large, low, flat turret.
3. The very long, thick gun tube; it's a 120mm gun.
4. The standardized shape of British armored skirts covering the suspension system. The skirts cover a large area and come down close to the ground and have the gradual upward slope in the rear.

Trial 15: ZSU 57-2, SR

- Threat, Soviet, ZSU 57-2, Air Defense Weapon.
- The 4 widely-spaced roadwheels seem to take up all of the space between the ground and top of the deck. This is characteristic of Soviet-designed suspension systems.
- This vehicle has one of the largest turrets you'll see on air defense weapons. So does the ZSU 23-4, another Soviet air defense weapon.

Trial 16: T54/55, F

- Threat, Soviet, T54/55 Tank.
- The low silhouette and round-shaped turret identify it as a possible Soviet tank.
- From this view it's often confused with a French tank, the AMX-30.
- This is the most difficult view. Take a good look.

Trial 17: Roland, SL

- Friendly, West German, Roland (Marder), Air Defense System.
- The 7 roadwheels help identify this vehicle.
- The thick, square personnel carrier body should also help you in identifying this vehicle.
- The rectangular radar dish mounted at the rear over the tubes is the acquisition radar, and the round radar dish mounted right between the launcher tubes is the very accurate tracking radar.
- This system is the all-weather Roland.
- There is also a fair-weather version which uses optical tracking.

Trial 18: Chieftain, SR

- Friendly, British, Chieftain Tank.
- The skirts and unusual turret configuration make this vehicle stand out, particularly in the side view.
- Note its long length and low skirting.
- The thing that should stand out in your mind is the large apparent size of the vehicle as compared to other vehicles.

Trial 19: ZSU 57-2, OL

- Threat, Soviet, ZSU 57-2, Air Defense Weapon.
- As I told you before, this vehicle does not use radar, but it does have a very sophisticated optical system for acquiring targets.
- The turret is probably its best identifying feature.

Trial 20: Jagdpanzer, OR

- Friendly, West German, Jagdpanzer (JPZ 4-5).
- It looks like a personnel carrier with a heavy gun tube sticking out of the front.
- Note the sloped armor at the rear.
- The main gun is a 90mm, high velocity gun.
- Also, note that it has 5 roadwheels. The Soviet ASU-85 has 6 roadwheels.
- The ASU-85 suspension does not use support rollers.

Trial 21: Roland, SR

- Friendly, West German, Roland (Marder), Air Defense Weapon.
- We can see clearly in this slide the rear radar dish.
- Note how the turret is mounted toward the rear of the vehicle.
- Take a good look at the outline of the chassis. It's the same as you'll see on the West German Marder APC.

Trial 22: Chieftain, SR

- Friendly, British, Chieftain Tank.
- The thing that stands out in my mind is the large size of the vehicle as compared to other vehicles.
- This tank appeared in the early 1960s.
- Iran has ordered approximately 1,950 of these tanks.

Trial 23: ZSU 57-2, OR

- Threat, Soviet, ZSU 57-2, Air Defense Weapon.
- Looks like a rolling pillbox.
- Has a crew of 6.

Trial 24: Jagdpanzer, F

• Friendly, West German, Jagdpanzer (JPZ 4-5).

• The very, very low flat-topped outline and the heavy gun mantle are its outstanding two features in the front view.

• The vehicle is very fast.

• This vehicle depends on its low silhouette and high mobility for its survival.

• The heavy front around the gun also provides good ballistic protection from frontal hits.

Trial 25: T54/55, SL

• Threat, Soviet, T54/55 Tank.

• Centered, rounded turret and low silhouette, plus suspension, lets us know it's Soviet.

• If you could see the bore evacuator, it might help you in identifying this model tank. The evacuator is on the end of the gun tube, not set back as in most current tanks.

Section B: Automated Lesson Outline

(15 second duration for each slide)

Trial 26: Jagdpanzer, OL

- Friendly, West German, Jagdpanzer (JPZ 4-5).
- The fact that it has no turret should help you in at least knowing the type of vehicle this is.
- A Belgian version has an improved fire control system and incorporates a laser rangefinder.

Trial 27: ZSU 57-2, OR

- Threat, Soviet, ZSU 57-2, Air Defense Weapon.
- Can fire 105 to 120 rounds per gun per minute.
- You can understand why the air cavalry wants to knock this one off quickly.

Trial 28: Chieftain, SL

- Friendly, British, Chieftain Tank.
- Its gun is exceptionally accurate and hard hitting.
- Note how long it looks from the side.

Trial 29: Roland, SR

- Friendly, West German, Roland (Marder), Air Defense Weapon.
- The Roland's missile cruising speed is approximately Mach 1.6.
- The length of the missile is approximately 2.5 meters.

Trial 30: T54/55, F

- Threat, Soviet, T54/55 Tank.
- This is its most difficult view.
- It's used by 25 countries besides the Warsaw Pact armies.

Trial 31: ZSU 57-2, SL

- Threat, Soviet, ZSU 57-2, Air Defense Weapon.
- This vehicle appeared in the late 1950s.
- The ZSU 57-2 and ZSU 23-4 are two of the most commonly employed frontline AA weapons systems.

Trial 32: Chieftain, SR

- Friendly, British, Chieftain Tank.
- The gun can hit armored targets out to 3000 meters with great accuracy.

Trial 33: Roland, F

- Friendly, West German, Roland (Marder), Air Defense Weapon.
- This vehicle has a narrow and very high outline in the front view.
- The range of the Roland missile is from 500 to 6500 meters.

Trial 34: T54/55, OL

- Threat, Soviet, T54/55 Tank.
- Small, well-rounded turret.
- Note large front gap between first 2 roadwheels.

Trial 35: Jagdpanzer, OR

- Friendly, West German, Jagdpanzer (JPZ 4-5).
- The useful range of the main gun is about 2000 meters.
- Carries a crew of 4.
- Carries 51 rounds of main gun ammunition.

Trial 36: Chieftain, F

- Friendly, British, Chieftain Tank.
- Considered to be one of the best tanks in the world.
- Look carefully at the turret lines.

Trial 37: Roland, OL

- Friendly, West German, Roland (Marder), Air Defense Weapon.
- The chassis is low and rectangular in shape, with the front slope starting about halfway back on the vehicle.
- The launcher tubes placed at the rear of the vehicle is another feature to remember.

Trial 38: T54/55, OR

- Threat, Soviet, T54/55 Tank.
- This vehicle weighs only 35.9 tons, as compared to 50 tons for the M60A1 and Chieftain.

Trial 39: Jagdpanzer, SL

- Friendly, West German, Jagdpanzer (JPZ 4-5).
- Again, notice the 5 roadwheels and support rollers.
- The very sloped all-around armor and heavy gun mantle.

Trial 40: ZSU 57-2, SR

- Threat, Soviet, ZSU 57-2, Air Defense Weapon.
- By this time you should have no problem with this vehicle.

Trial 41: Roland, OR

- Friendly, West German, Roland (Marder), Air Defense Weapon.
- The US Roland is expected to attain initial operational capability in the early 1980s.
- You can see very clearly the turret location in this oblique view.

Trial 42: T54/55, SL

- Threat, Soviet, T54/55 Tank.
- It's very cramped inside.
- The T54 has a 12.7 AA weapon; the T55 doesn't.

Trial 43: Jagdpanzer, SR

- Friendly, West German, Jagdpanzer (JPZ 4-5).
- Crew compartment in front with the gun tube coming out the very front edge of the vehicle types it as a self-propelled antitank vehicle.
- Note that the rear deck is lower than the front crew compartment.

Trial 44: ZSU 57-2, F

- Threat, Soviet, ZSU 57-2, Air Defense Weapon.
- Has an effective range out to 4000 meters.
- Its square, boxy shape is its foremost feature.

Trial 45: Chieftain, OL

- Friendly, British, Chieftain Tank.
- Can fire high-explosive ammunition out to 8000 meters.

Trial 46: T54/55, SR

- Threat, Soviet, T54/55 Tank.
- Centered, rounded turret and low silhouette, plus suspension, lets you know it's Soviet.

Trial 47: Jagdpanzer, F

- Friendly, West German, Jagdpanzer (JPZ 4-5).
- The vehicle is very small in appearance and weighs only 26 tons.
- The heavy gun mantle is readily identifiable in this particular view.

Trial 48: ZSU 57-2, OL

- Threat, Soviet, ZSU 57-2, Air Defense Weapon.
- This vehicle cannot swim.
- You shouldn't have any trouble identifying this vehicle--it's unique.

Trial 49: Chieftain, OR

- Friendly, British, Chieftain Tank.
- The gun is stabilized in azimuth and elevation to permit firing on the move.
- Note the many angled turret design and large, low hull.

Trial 50: Roland, SL

- Friendly, West German, Roland (Marder), Air Defense Weapon.

- You'll also see the Roland on French, Brazilian, Norwegian, and possibly, Turkish vehicles.

- The warhead is a high-explosive with proximity fuse.

MODULE 6: TARGET ARRAY
T-62
T-72
AMX-30
M60A1
Leopard

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 6

Section A: Manual Training Sequence

Trial	Vehicle	View
1	T-62	SL
2	M60A1	SR
3	T-72	OL
4	Leopard	OR
5	AMX-30	F
6	M60A1	OL
7	T-72	OR
8	Leopard	F
9	AMX-30	SL
10	T-62	SR
11	T-72	F
12	Leopard	SL
13	AMX-30	SR
14	T-62	OL
15	M60A1	OR
16	Leopard	SR
17	AMX-30	OL
18	T-62	OR
19	M60A1	F
20	T-72	SL
21	AMX-30	OR
22	T-62	F
23	M60A1	SL
24	T-72	SR
25	Leopard	OL

MODULE 6: TARGET ARRAY
T-62
T-72
AMX-30
M60A1
Leopard

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Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 6

Section B: Automated Training Sequence

Trial	Vehicle	View
26	T-72	SR
27	M60A1	F
28	T-62	OL
29	AMX-30	OR
30	Leopard	SL
31	M60A1	OL
32	T-62	OR
33	AMX-30	SL
34	Leopard	SR
35	T-72	F
36	T-72	SL
37	AMX-30	SR
38	T-72	OL
39	Leopard	F
40	M60A1	OR
41	AMX-30	F
42	Leopard	OL
43	T-72	OR
44	M60A1	SL
45	T-62	SR
46	Leopard	OR
47	T-72	SL
48	M60A1	SR
49	T-62	F
50	AMX-30	OL

MODULE 6: TARGET ARRAY
T-62
T-72
AMX-30
M60A1
Leopard

Instructor's Copy
Primary Set

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 6

Section C: Final Tests (Automated)*

	Trial	Vehicle	View
Test I			
	1	AMX-30	OR
	2	T-62	F
	3	M60A1	SL
	4	T-72	SR
	5	Leopard	OL
Test II			
	1	T-62	SL
	2	M60A1	SR
	3	T-72	OL
	4	Leopard	OR
	5	AMX-30	F
Test III			
	1	M60A1	OL
	2	T-72	OR
	3	Leopard	F
	4	AMX-30	SL
	5	T-62	SR
Test IV			
	1	T-72	F
	2	Leopard	SL
	3	AMX-30	SR
	4	T-62	OL
	5	M60A1	OR
Test V			
	1	Leopard	SR
	2	AMX-30	OL
	3	T-62	OR
	4	M60A1	F
	5	T-72	SL

*Instructor will use only 1 of 5 possible Final Tests for this Module. Test should be chosen at random.

6TH ACCB LONG RANGE RECOGNITION AND IDENTIFICATION TRAINING PROGRAM

MODULE 6

Section A: Manual Training Outline

Trial 1: T-62, SL

• Threat, Soviet, T-62 Tank.

• Its most distinctive feature is the overturned, cup-shaped turret.

• Note that the turret is centered on the hull. This type of turret is characteristic of all modern Soviet battle tanks.

• The main gun is relatively long in relationship to the length of the hull.

Trial 2: M60A1, SR

• Friendly, American, M60A1 Tank.

• This slide shows clearly the long turret and high turret sidewalls.

• Note the cupola and the very squared look of the back of the turret.

Trial 3: T-72, OL

• Threat, Soviet, T-72 Tank.

• In this slide you can see the high, thick sponsons tapering toward the front of the tank. Also, notice the high front fender line at the front of the prow.

• The low silhouette and rounded turret of the vehicle definitely stamp this vehicle as Soviet.

• Note how the turret is well back toward the center of the tank.

Trial 4: Leopard, OR

- Friendly, West German, Leopard Tank.
- In this picture we can see clearly the length of the main gun.
- Also, note the heavy gun mantle.
- The dark bar on the side of the turret is the smoke grenades.

Trial 5: AMX-30, F

- Friendly, French, AMX-30, Light Tank.
- This tank is misidentified as a threat vehicle more than any other friendly vehicle. Take a careful look, as this is the most difficult of all vehicles to recognize or identify.
- It has 2 major features that may help you:

1. The very low, oval-shaped turret; the turret lines are smooth and unbroken.

2. The fairly large, flat frontal area leading up to the turret.

- There is a commander's cupola, but it's difficult to see.

Trial 6: M60A1, OL

- Friendly, American, M60A1 Tank.
- The first thing that strikes you in this view is the rather large turret. The turret armor is not rounded but retains a flat surface look.
- The suspension uses roadwheels with support rollers over which the top of the track rolls.
- You can barely see the cupola.
- The turret is fairly well centered and takes up a large volume of space when compared to the hull size.

Trial 7: T-72, OR

- Threat, Soviet, T-72 Tank.

- In this slide you should see all the features which are characteristic of Soviet tanks.

- The length of the gun tube appears to be extremely long; looks about as long as the chassis.

- The turret is what I call high-domed rather than slope-domed.

- Fuel cells cover almost the whole length of the right-hand fender and rear half of the left fender.

- Note the deck line. At the rear it looks like an amphibious design and then tapers toward the front. Keep in mind how the front of the track and suspension appear to taper towards the front of the vehicle.

Trial 8: Leopard, F

- Friendly, West German, Leopard Tank.

- High, narrow box shape.

- Distinctive sharp side slopes on the turret.

- Note how well the searchlight blends in with the turret in this view.

Trial 9: AMX-30, SL

- Friendly, French, AMX-30, Light Tank.

- Look at the distinctive low, oval turret.

- The muffler on the rear of the vehicle can aid in identification.

- Note how the turret armor slopes and meets the deck lines, giving it a very sloped look.

- The gun tube has no bore evacuator or muzzle brake, and the gun tube is very thick.

Trial 10: T-62, SR

• Threat, Soviet, T-62 Tank.

• Note the dome-shaped, centrally located turret.

• The bore evacuator on this tank is mounted a little way back from the front of the gun tube. At far ranges the evacuator can't be seen.

• The T-62 has grabrails located midway across the turret. In some pictures you can see them, in others you cannot.

• Note the gap in the roadwheels. The space between these two roadwheels is wider than the others. I want you to remember that on the T-62, the gap is located toward the rear of the track. Remember, in the T-62 the gap is to the rear. You will see why this is significant when we compare the T-62 to other Soviet tanks.

Trial 11: T-72, F

• Threat, Soviet, T-72 Tank.

• The turret is not quite as low as the AMX-30.

• The front of the T-72 is relatively uncluttered.

• The turret is equally rounded and sets in a little on both sides from the edge of the tank.

• The main gun is a 125mm gun, the biggest of all main battle tanks.

Trial 12: Leopard, SL

• Friendly, West German, Leopard Tank.

• The main distinguishing feature is the square lines which characterize the whole tank (square grills, square end, and square turret lines).

Trial 13: AMX-30, SR

- Friendly, French, AMX-30, Light Tank.
- By this time you should be able to identify this tank without too much trouble. Its beetle shape makes it look like Soviet vehicles, but it appears much bigger than the Soviet tanks.
- The tank was designed primarily to fight other tanks.

Trial 14: T-62, OL

- Threat, Soviet, T-62 Tank.
- In this view we get a better look at how the front armor is sloped.
- Note that the edge of the prow is very low to the ground.
- Keep in mind the slope and centered turret.
- It has 5 roadwheels with the gap toward the rear.
- You can see the searchlight and what looks like a machinegun.

Trial 15: M60A1, OR

- Friendly, American, M60A1 Tank.
- The suspension design and large turret area should help you in identifying this vehicle.
- Pay particular attention to the very high turret lines; the cupola adds to that height.
- The relative size of the turret and hull are proportional (same size roughly).

Trial 16: Leopard, SR

- Friendly, West German, Leopard Tank.
- The feature that stands out from a side view is the boxy (squared) shape.
- Its most distinctive feature is the scalloped skirts.
- The rather rectangular and elongated turret.
- The squared, or bobbed, rear of the vehicle.
- Note the large number of roadwheels (7).
- Note the searchlight. If it is mounted, this cue may help in identifying the vehicle, but do not rely on it, as it can be stowed or may not even be carried on the tank.

Trial 17: AMX-30, OL

- Friendly, French, AMX-30, Light Tank.
- Note the very flat, low turret.
- This particular slide does show the searchlight, but don't rely on it as your only cue.
- The front slope has a fairly sharp angle; note the absence of definitive fender lines. The fenders seem to blend in with the front armor rather than stand out in relief, as in the T-72 tank.
- One thing which does differentiate this vehicle from the Soviet is its much higher silhouette and the non-Soviet type suspension systems.

Trial 18: T-62, OR

- Threat, Soviet, T-62 Tank.
- By this time you should know the main features of the T-62.
- You can see the handrails and searchlight; note that the shadow hides the roadwheels.
- I would like to point out some very minor features. First, the smooth gradual front slope; and second, the smooth taper of the top of the turret.

Trial 19: M60A1, F

• Friendly, American, M60A1 Tank.

• At first glance in this particular slide, the M60A1 looks much like a Soviet tank.

• You're probably used to seeing the very prominent commander's cupola on the left of the vehicle. Do not depend on it as your only cue. Shown here, the cupola is very difficult to see.

• Note the sharp prow line and the characteristic sharp, flat, angled surfaces at the front of the turret. When this turret first came out, it was called "needlenosed." You'll see more of it.

• The relative overall large size of the M60A1 makes it stand out when compared to other vehicles. It stands fairly high in comparison to Soviet tanks. All modern Soviet tanks are built extremely low.

Trial 20: T-72, SL

• Threat, Soviet, T-72 Tank.

• The fording snorkel can be seen on the side of the turret. Don't rely on this cue, as almost all fording equipment is portable and not built into the vehicle. In some pictures it has been seen carried on the back deck.

• The deck and track line makes this vehicle stand out from other Soviet tanks. The track uses support rollers like our tanks.

• Note that the turret is slightly tapered toward the front.

• Large spare fuel drums can be carried across the back of the tank. This is also characteristic of Soviet vehicles. The US experimented with them many years ago.

Trial 21: AMX-30, OR

• Friendly, French, AMX-30, Light Tank.

• This slide shows very clearly the external muffler located conspicuously at the rear of the AMX-30. There's another one on the other side in the same location. Use these to help you, but don't rely on using them at longer ranges. They wash out.

• We have the low, beetle-like turret. Notice how the armor slopes all around the turret.

• It is the lightest (36 tons) main battle tank mounting a 105mm gun.

Trial 22: T-62, F

• Threat, Soviet, T-62 Tank.

• This is the most difficult view, so take a good look at it.

• Note the sharp prow line, the extremely low silhouette, and the dome- or cup-shaped turret.

• In this slide you can see one of the IR searchlights with which this tank is equipped. Do not depend on this cue, but simpy use it as a reinforcer along with the other vehicle characteristics.

Trial 23: M60A1, SL

• Friendly, American, M60A1 Tank.

• Recent experimental tests with air cavalry personnel disclosed that our own forces misidentify the M60A1 as a Soviet or French tank fairly often. Take a good look at it.

Trial 24: T-72, SR

- Threat, Soviet, T-72 Tank.
- This is the latest Soviet main battle tank.
- Distinctive features are:

1. Low silhouette. The suspension uses support rollers, which is a departure for Soviet tanks.
2. Teacup-shaped turret with an extremely long main gun.
3. Turret is centered on the chassis.
4. Also, note the gradual, downward sloping to the front which gives the track a tapered appearance.

Trial 25: Leopard, OL

- Friendly, West German, Leopard Tank.
- In this slide we can see the grill doors on the rear of the vehicle. There is also a grill on the other side of the vehicle.
- Note the scalloped skirting, rather compact body shape, with a lot of roadwheels showing.
- Also, note what appears to be a very sharp angle at the front of the turret.
- Note the very thick section between the bottom of the turret and the visible portion of the roadwheels.

Section B: Automated Training Outline

(15 second duration for each slide)

Trial 26: T-72, SR

- Threat, Soviet, T-72 Tank.
- It has a 3-man crew and an auto-loader.
- It employs light armor plate skirts on the front half of each side. They stick out at a 60° angle when not tied back.
- Remember where the turret is placed and the long gun tube.

Trial 27: M60A1, F

- Friendly, American, M60A1 Tank.
- Reminiscent of a Soviet vehicle from the front.
- The new model will feature a low profile commander's cupola.

Trial 28: T-62, OL

- Threat, Soviet, T-62 Tank.
- It has 4 crew members.
- Note the line running across the front slope.

Trial 29: AMX-30, OR

- Friendly, French, AMX-30, Light Tank.
- We have the low, beetle-like turret. Notice how the armor slopes all around the turret.
- Carries a crew of 4.

Trial 30: Leopard, SL

- Friendly, West German, Leopard Tank.
- Scalloped skirts and square grills on the back.

Trial 31: M60A1, OL

- Friendly, American, M60A1 Tank.
- This vehicle is currently being improved. Will be called the M60A3.
- Note the large turret.

Trial 32: T-62, OR

- Threat, Soviet, T-62 Tank.
- Came out in 1961.
- Diesel powered.

Trial 33: AMX-30, SL

- Friendly, French, AMX-30, Light Tank.
- Note how the turret armor slopes and meets the deck lines, giving it a very sloped look.
- Its oblique angles provide it good ballistic protection.
- Its gun is effective out to 3000 meters, using an antitank round.

Trial 34: Leopard, SR

- Friendly, West German, Leopard Tank.
- It has 7 roadwheels.

Trial 35: T-72, F

• Threat, Soviet, T-72 Tank.

• The turret is equally rounded and sets in a little on both sides from the edge of the tank.

Trial 36: T-62, SL

• Threat, Soviet, T-62 Tank.

• There is larger spacing between the 3rd and 4th and 4th and 5th roadwheels. The first three roadwheels are much closer together.

Trial 37: AMX-30, SR

• Friendly, French, AMX-30, Light Tank.

• Later production model will mount a 20mm coaxial weapon.

• I think of a beetle when I see this tank.

Trial 38: T-72, OL

• Threat, Soviet, T-72 Tank.

• The T-72 mounts a toothed-shovel/dozer blade in front. This enables it to dig itself in, in a few minutes.

• It also mounts two large, square bustle boxes on each side at the rear of the turret. This slide does not show them. They make the vehicle much easier to identify.

Trial 39: Leopard, F

• Friendly, West German, Leopard Tank.

• The sharp cut sides of the turret front and high prow lines may help you in identifying this vehicle.

Trial 40: M60A1, OR

- Friendly, American, M60A1 Tank.
- Newer model will have flexible side skirts and a loader's machine-gun on the hatch.
- The turret and high hull are distinctive features.

Trial 41: AMX-30, F

- Friendly, French, AMX-30, Light Tank.
- It has 2 major features that may help you:

1. The very low, oval-shaped turret; the turret lines are smooth and unbroken.

2. The fairly large, flat frontal area leading up to the turret.

Trial 42: Leopard, OL

- Friendly, West German, Leopard Tank.
- The turret sets slightly forward on the tank and has sharply angled armor.

Trial 43: T-72, OR

- Threat, Soviet, T-72 Tank.
- The diesel engine is smooth running and free of the smoke signature you'd usually get with a diesel.
- The commander and gunner hatches are forward hinged, so they offer ballistic protection in the open position.

Trial 44: M60A1, SL

- Friendly, American, M60A1 Tank.
- The high suspension and large turret give this vehicle a very high profile.

Trial 45: T-62, SR

- Threat, Soviet, T-62 Tank.
- Cup-shaped, centered turret is characteristic of Soviet tanks.
- Has 5 roadwheels in a Christie-type suspension.

Trial 46: Leopard, OR

- Friendly, West German, Leopard Tank.
- Mounts a 105mm gun.
- It has a 7.62mm that can be mounted either on the commander or loader hatches.

Trial 47: T-62, SL

- Threat, Soviet, T-62 Tank.
- Note that the turret is slightly tapered toward the front.
- It is believed that this vehicle employs the first Soviet stereoscopic rangefinder.

Trial 48: M60A1, SR

- Friendly, American, M60A1 Tank.
- Note especially the large gap from the top of the roadwheels to the top of the track.

Trial 49: T-62, F

- Threat, Soviet, T-62 Tank.
- Presents a very low profile in the front view.

Trial 50: AMX-30, OL

- Friendly, French, AMX-30, Light Tank.

- One thing which does differentiate this vehicle from Soviet vehicles is its much higher silhouette and the non-Soviet type suspension system.